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CORRODENTIA OF THE UNITED STATES  
OF AMERICA: I. SUBORDER  
ISOTECNOMERA

BY PAUL J. CHAPMAN

(Continued from page 290)

Family CAECILIIDÆ

Subfamily CAECILIINÆ

*Caecilius* Curtis 1837

Type: *Caecilius flavidus* Stephens 1836.

Since Curtis erected this genus in 1837 it has been considerably limited by the erection of a number of genera which have a wing venational order more or less in common with the original genus. In spite of these redefinitions *Caecilius* is still a large genus, including species from many parts of the world. Cell  $Cu_1$  of the fore wing is small—somewhat semicircular. Short hairs occur on the veins, wing margins, in the pterostigmal cell where they are exclusively confined. The terminal abdominal segments and genitalia of both sexes are weakly chitinized. They are not very useful in distinguishing the species. In the female the gonapophyses are reduced to two pairs of weak, insignificant blades; the dorsal pair may be forked or bear a lobe proximally. In the male two pairs of parameres and a penis appear to be present. The structures are symmetrical and of much more simple design than in *Psocus*.

## KEY TO CAECILIUS

- 1—Wings entirely brown, or largely marked with brown; wings of ♀ sometimes reduced. Head and thorax mostly dark brown.....2  
 —Wings paler, not spotted or banded, subhyaline, tan or salmon; macrop-  
 terous forms only, known to exist. Head and thorax rather pale in  
*C. aurantiacus*, tergal lobes sometimes dark brown.....3
- 2—Wings uniformly brown, length about 2.5 mm. or more.....*confluens*  
 —Wings of ♂ about 2.0 mm. long, hyaline, marked with brown; ♀ usually  
 subapterous .....*posticus*
- 3—Length of wings about 3.0 mm. (♂ sometimes about 2.7 mm.).....4  
 —Wing length about 2.3 mm. ....7
- 4—Ocellar interval pale, concolorous with surroundings. In ♀ lateral  
 chitinized strips (not conspicuous) on subgenital plate.  
*quillayute* n. sp.  
 —Ocellar interval dark brown or black. Subgenital plate weakly chiti-  
 nized throughout .....5
- 5—Veins in distal half of fore wings brown, in distinct contrast to pale  
 basal portions; cell 2A brown. Dorsum of thorax usually much more  
 deeply colored than sides.....*aurantiacus*  
 —Veins in distal half not in contrast to those in proximal half; cell 2A  
 not darker. No sharp contrast between intensity of color on dorsum  
 and sides of thorax.....6
- 6—Head pale with a pair of distinct reddish or brown spots—one on each  
 side of the ocelli.....*pinicola*  
 —Head pale, markings obscure. Wings of ♂ longer than ♀.  
*perplexus* n. sp.
- 7—Wings subhyaline. Vein 1A not haired.....*subflavus*  
 —Wings tan or salmon, veins same. Ocellar interval usually not darker  
 than surroundings. Hairs on vein 1A.....*croesus* n. sp.

**Caecilius aurantiacus** Hagen

*Psocus aurantiacus* Hagen. Syn. Neuropt. of North Am., p.  
 10. 1861.

*Caecilius aurantiacus* Hagen. Verh. zool.-bot. Ges. Wein 16:  
 205. 1866.

## Female:

Length of body 2.4 mm. ave. of 10 individuals.

Length of fore wings 3.0 mm. ave. of 10 individuals.

Length of antennæ 2.8 mm. ave. of 10 individuals.

Body mostly dull white; dorsum of head and thorax marked  
 with brown; wings tan, veins brown in distal half, pale in proxi-  
 mal half.



Head: Vertex with a triangular light brown area centering on the epicranial suture—the apex at the clypeal margin; *interval between the ocelli black or dark brown*; clypeus faintly lineated with broad, mesally directed tan lines which fade anteriorly; remainder of head unmarked. Maxillary palpus pale throughout. Segments 1–3 of antennæ pale brown, remainder darker, in some individuals deep brown. Eyes small, black.

Thorax: Tergal lobes brown, ranging from a golden brown to a dark brown; sutures and pleuræ dull white, tinged sometimes with tan. Legs pale; second tarsal joint light brown, claws dark brown. Wings (Pl. XXI, Fig. 14) uniformly light tan or salmon. *Typically the brown veins in distal half of wing in distinct contrast to the pale proximal portions*; narrow margins of brown accentuate the contrast in some individuals. Cell 2A uniformly light brown. Pterostigma opaque, roughly isosceles triangular in shape but  $R_1$  gently rounded. Hind wing pale, likewise the veins.

Abdomen dull white throughout. Genitalia weakly chitinized, structures not readily visible in unstained material (Pl. XVI, Fig. 10). The subgenital plate is the not greatly modified 7th sternite; distal margin rather narrow, slightly concave and indefinitely cleft midway while the lateral angles are drawn out slightly. The median part of the plate is beset with numerous long spines while laterally the spines shorter. The gonapophyses consist of two pairs of long, very slender, sharp pointed, nearly parallel blades. A widening at the base of the caudal pair probably indicates a vestige of the lateral gonapophyses—the blade-like portion being the dorsal gonapophyses. The distal half of the lateral surfaces of paraprocts pilose.

Male:

Length of body 1.8 mm. ave. of 10 individuals.

Length of fore wings 2.7 mm. ave. of 10 individuals.

Length of antennæ 2.8 mm. ave. of 9 individuals.

The male is considerably paler throughout than female, eyes about three times as large, bluish black. Wings pale; veins brown distally, pale proximally. Body white, not as strongly marked as female. Abdomen slender, curved upwards.

Genitalia (Pl. XVI, Fig. 2) rather weakly chitinized but the triangular shaped ensemble of penis and parameres usually readily visible. The hypandrium broadly joined and seemingly contiguous with the tergite; the median portion clothed with hairs which are shortest in the caudo-mesal part; the caudal margin is gently rounded. The penis and parameres form a triangular structure as in other Caeciliidæ; the two pairs of parameres occupy the distal half; the inner pair are slender, highly chitinized, and fused distally; the outer pair are less strongly chitinized, scroll-like, abruptly pointed. The basal arms almost meet midway. Viewed *in situ*, the portion lying between the bases of the clypeus (penis?) shaped as the letter Y. The paraprocts flat, pilose in caudo-mesal area. Sense tubercles rather small, dark, much elevated.

New York: Ithaca, July 5, 1926, 3 ♀; July 11, 1926, 15 ♀ 1 ♂; Aug. 1, 1926, 19 ♀ 3 ♂; Aug. 6, 1926, 2 ♀; Aug. 8, 1925, 8 ♀ 1 ♂; Aug. 24, 1924, 4 ♀; Sept. 12, 1925, 1 ♀ laying egg in crevice on bark of maple; Sept. 26, 1926, 2 ♀; Oct. 5, 1926, 1 ♀ sweeping grass (P. P. Babiy); Danby, Oct. 19, 1927, 27 ♀; Enfield Glen, Tompkins Co., Aug. 23, 1925, 14 ♀ 7 ♂; Freeville, Oct. 12, 1924, 2 ♀; Woodwardia Swamp, Tompkins Co., Aug. 10, 1924, 7 ♀; McLean Res., July 16, 1924, 2 ♀, July 31, 1926, 1 ♀; Chapel Pond, Essex Co., Sept. 19, 1925, 4 ♀ (S. C. Bishop); Avalanche Lake, Essex Co., Sept. 2, 1927, 5 ♀ 3 ♂; July 25, 1925, 1 ♀ 1 ♂ (C. R. C.); Adirondack Lodge, Essex Co., Sept. 2, 1927, 4 ♀; Mt. McIntyre, Essex Co., Sept. 4, 1927, 1 ♀ at about 4300 ft.; Jabes Pond (Lake George), Sept. 11, 1925, 4 ♀ 1 ♂ (M. D. Leonard); Michigan Mills, Lewis Co., Sept. 1, 1926, 9 ♀; Parkers, Lewis Co., Sept. 2, 1926, 4 ♀; Whetstone Gulf, Lewis Co., Sept. 2, 1926, 12 ♀; Nigger Pond, Oswego Co., Sept. 3, 1926, 7 ♀ 1 ♂; Saratoga Springs, July 14, 1926, 1 ♀; Paul Smiths, Aug. 31, 1927, 2 ♀; Tuxedo, Oct. 7, 1925, 1 ♀ (A. Wolf); Larchmont, Sept. 25, 1925, 7 ♀ (A. Wolf); Catskill, Aug. 17, 1925, 2 ♀; Hunter, Aug. 16, 1925, 17 ♀ 3 ♂ misc. beating; Sea Cliff, L. I., Sept. 6, 1925, 5 ♀; Baiting Hollow, Suffolk Co., Sept. 19, 1926, 2 ♀; Loucks Pond, Steuben Co., July 5, 1924, 1 ♀; Howard, July 5, 1924, 3 ♀; Bean's Station, Steuben Co., 1 ♀; Cinnamon Lake, Schuyler Co., July

4, 1924, 15 ♀; July 12, 1924, 3 ♀; Elmira, Oct. 1, 1925, 6 ♀; Painted Post, Sept. 15, 1925, 6 ♀; Hammondsport, July 6, 1924, 1 ♂; Barcelona, Sept. 19, 1925, 3 ♀; Montour Falls, Sept. 21, 1924, 10 ♀; Wellsville, Sept. 15, 1925, 1 ♀; Richburg, Sept. 16, 1925, 9 ♀; Rock City, Sept. 16, 1925, 12 ♀; Little Valley, Sept. 17, 1925, 6 ♀; Silver Creek, Sept. 18, 1925, 2 ♀; Penn Yan, July 29, 1925, 13 ♀ 4 ♂, Aug. 2, 1925, 18 ♀; Egglestone Glen, July 3, 1925, 1 ♀ (C. R. C.); Geneseo, Sept. 20, 1925, 1 ♀; Olecott, Sept. 19, 1925, 2 ♀; Ceres, Sept. 16, 1925, 3 ♀; Stow, Sept. 17, 1925, 17 ♀; West Barre, Sept. 17, 1925, 2 ♀.

Maine: Island Falls, Aug. 16, 1925, 1 ♀ (C. R. C.); Sebasticook Lake, Aug. 24, 1925, 29 ♀ (C. R. C.); Falmouth, Aug. 30, 1925, 1 ♀ (C. R. C.); Presque Isle, Aug. 26, 1925, 11 ♀ (C. R. C.); Molunkus Pond, Aug. 25, 1925, 3 ♀ 2 ♂ (C. R. C.); Houlton, Aug. 26, 1925, 6 ♀ 1 ♂ (C. R. C.); Winterport, Aug. 29, 1925, 1 ♀; Southwest Harbour, Mt. Desert Is., Aug. 31, 1926, 5 ♀ 3 ♂ (C. P. Alexander); Beech Mt., Mt. Desert Is., Sept. 12, 1926, 13 ♀ (C. P. Alexander).

New Hampshire: Meredith, Aug. 22, 1925, 5 ♀ (C. R. C.); Littleton, Aug. 19, 1925, 2 ♂ (C. R. C.).

Pennsylvania: Potters Mills, Oct. 31, 1924, 3 ♀ (C. R. C.); Roxbury, Oct. 30, 1924, 3 ♀ (C. R. C.); New Bloomfield, Oct. 31, 1924, 2 ♀ (C. R. C.); Arendtsville, Aug. 23, 1924, 1 ♀ from stomach of frog (*Hyla pickeringii* Holbrook) (S. W. Frost).

New Jersey: Englewood Cliff, Sept. 6, 1925, 2 ♀ 1 ♂.

Virginia: Blacksburg, Oct. 4, 1926, 1 ♀ (C. R. C.); Fredericksburg, Oct. 28, 1926, 2 ♀ (C. R. C.).

Kentucky: Valley View, June 28, 1925, 2 ♀; Lexington, July 5, 1925, 1 ♀ (L. Giovannoli); Quicksand, June 25, 1925, 14 ♀ 3 ♂; Mammoth Cave (outside), July 1, 1925, 2 ♀.

North Carolina: Frying Pan Gap, Oct. 13, 1926, 9 ♀ (C. R. C.); Mt. Pisgah, Oct. 14, 1926, 4 ♀ (C. R. C.); Cowee Mts., Swain Co., Oct. 15, 1926, 2 ♀ (C. & B.); Junaluski Gap, Macon Co., Oct. 17, 1926, 1 ♀ (C. & B.); Andrews, Oct. 17, 1926, 1 ♀ (C. & B.); Nantahala Gap, Macon Co., Oct. 14, 1926, 3 ♀ (C. & B.); Whitakers, Oct. 25, 1926, 1 ♀ 1 ♂ (C. & B.); Grandfather Mt., Oct. 12, 1923, 2 ♀ (C. R. C.); Jacksonville, Oct. 23, 1926, 1 ♂ (C. & B.); Blowing Rock, Oct. 10, 1923, 1 ♀ (C. R. C.).

Tennessee: Laurel Creek, Sevier Co., Oct. 8, 1926, 16 ♀ 2 ♂ (C. & B.); Bristol, Oct. 5, 1926, 2 ♀ at light of Coca-cola stand (C. & B.); Mill Creek below falls on Mt. LeConte, 27 ♀ 1 ♂ (C. & B.).

Georgia: Top of Blue Ridge at Towns and Rabun Co. line, Oct. 18, 1926, 1 ♀ (C. & B.); Dalton, 1859, 1 ♀ (Sacken). Holotype M. C. Z.

South Carolina: Sumter, Oct. 20, 1926, 1 ♀ (C. & B.).

Florida: Lake Bradford, Leon Co., April 13, 1927, 4 ♀ 5 ♂ (C. R. C.); The Glen, Marion Co., March 6, 1927, 2 ♀ (M. D. Leonard); Newnans Lake, May 15, 1926, 1 ♂ (T. H. Hubbell).

Washington: La Push, Aug. 10, 1927, 1 ♀ (C. R. Crosby); Lake Sutherland, Aug. 10, 1927, 1 ♀ (C. R. C.); Seattle, Aug. 7, 1927, 1 ♀ (C. R. C.).

#### **Caecilius confluens** Walsh

*P(socu)s confluens* Walsh. Ent. Soc. Phil. Proc. **2**: 185. 1863.

*Caecilius confluens* Hagen. Verh. zool.-bot. Ges. Wein **16**: 212. 1866.

*Caecilius umbrosus* Banks. Acad. Nat. Sci. Phila. Proc. **66**: 612. 1914.

Female (*macropterous*):

Length of fore wings 2.5 mm. ave. of 4 individuals.

Length of body 2.0 mm. ave. of 4 individuals.

Length of antennæ 1.85 mm. ave. of 3 individuals.

Wings uniformly brown, body predominately brown.

Head mostly brown; on vertex a pale U, ocellar interval black. Clypeus and labrum uniform brown, lineation on former indistinct. Genæ unmarked light brown. Antennæ and maxillary palpi light brown throughout. Eyes dull black.

Thorax: Brown, paling at sutures. Legs pale. Wings uniform brown, varying in intensity with individuals; pterostigma typically paler than other cells, opaque, rather deep, subangulate. Veins coarse, light brown. Hind wing light brown, unmarked.

Abdomen incompletely ringed with light greyish brown with the genitalia dark brown. Genitalia (Pl. XVI, Fig. 5) readily visible; the subgenital plate with distinct V-shaped chitinization;



on each side of the cleft apex the chitinization curls under, causing the apical margin to be semicircular when viewed directly from the rear; hairs on subgenital plate long distally, short hairs rather uniformly distributed elsewhere. Gonapophyses identical with *aurantiacus* except for the proximal shape and attachment of the dorsal pair. It presents a slightly concave margin to the tergite and is attached at a point midway; a dorso-lateral portion large, nearly square, with one spine at distal margin. Sense tubercles on paraprocts large, distinct. Suranal plate uniformly chitinized, blunt pointed, triangular, without distal row of long stout spines as in *posticus*.

Female (*brachypterous*):

Length of fore wings 1.0 mm. ave. of 8 individuals.

Venation reduced, cells distorted; deeper colored; pterothorax smaller; otherwise as *macropterous* forms.

Male:

Length of fore wings 2.65 mm. ave. of 6 individuals.

Length of body 1.65 mm. ave. of 6 individuals.

Length of antennæ 2.4 mm. ave. of 6 individuals.

Differs from female in the much larger size of the eyes, the slightly stouter antennæ, the paler more uniform brown of the wings and the slender upward-curved abdomen.

Genitalia (Pl. XVI, Fig. 3) typical of genus. Suspended between the parameres a diamond shaped structure composed of four parts including the penis. A basal plate is circular in outline, a pair laterally, triangular. What may be the penis lies between the lateral plates and extends toward junction of inner clasper. This part is bipartite—a pair of closely appressed spindle-shaped lobes. Chitinization on hypandrium weak, midway; distal margin definite, convex; slightly pilose laterally. Suranal plate produced into a small much elevated knob distally.

New York: Woodwardia Swamp, Tompkins County, August 10, 1924, 10 ♀ (6 *brachypterous*) 3 ♂; Fairhaven, Sept. 7, 1924, 4 ♀ (3 *brachypterous*); McLean, July 16, 1924, 4 ♀ (*brachypterous*); Hunter, Aug. 16, 1925, 2 ♀ (1 *brachypterous*); Ithaca, Aug. 14, 1924, 1 ♀ 2 ♂; Sept. 23, 1924, 1 ♂; Hillside, Fulton Co., 1 ♂. Holotype of *Caecilius umbrosus* Banks. M. C. Z.



**Caecilius croesus** new species

## Female:

Length of body 2.0 mm. ave. of 7 individuals.

Length of fore wings 2.3 mm. average of 7 individuals.

Length of antennæ 1.7 mm. average of 7 individuals.

Superficially resembling *Lachesilla rufa* in size and coloring.

Head and thorax concolorous, a light golden brown or tan; dorsum clothed with hairs and only slightly darker than sides and venter. *Ocellar interval concolorous with surroundings*. Head unmarked, lineation on clypeus obscured, eyes dull black. Antennæ stout, concolorous with head.

Wings (Pl. XXI, Fig. 7) pale salmon and veins almost concolorous. The veins would be less distinct were they not indicated by the rather long dark hairs along their course. *Vein 1A beset with hairs unlike other members of the genus*; cell 2A no darker than remainder of wing.

Abdomen paler than head and thorax although not white. The terminal segments and genitalia resemble *aurantiacus*, especially the gonapophyses. The hairs on the subgenital plate are possibly more sparse.

## Male:

Length of body 1.5 mm.

Length of fore wings 2.3 mm.

Length of antennæ 2.0 mm.

Almost identical with female in coloration. Eyes much larger, antennæ stouter and the abdomen slender, curved upward.

The genitalia resemble *aurantiacus* except the ensemble of parameres and penis is very weakly chitinized and the part between the parameres does not resemble the letter Y.

North Carolina: Lake Waccamaw, Oct. 21, 1926, 8 ♀ 3 ♂ (C. & B.). Holotype (♂), Allotype and Paratypes.

New York: Artist Lake, Suffolk Co., Sept. 19, 1926, 3♀ 2 ♂ on larch (Paratypes); Penn Yan, Aug. 2, 1925, 5 ♀ 6 ♂; Montour Falls, Sept. 26, 1924, 7 ♀ 3 ♂.

Kentucky: Quicksand, June 25, 1925, 3 ♀ 1 ♂; Valley View, June 28, 1925, 1 ♀ 1 ♂; Brooklyn Bridge, June 29, 1925, 2 ♀ 2 ♂.

**Cæcilius perplexus** new species

## Female:

Length of body 2.4 mm. ave. of 5 individuals.

Length of fore wings 3.1 mm. ave. of 5 individuals.

Length of antennæ 2.1 mm. ave. of 4 individuals.

Almost identical with *cræsus* in coloring including the wings (Pl. XXI, Fig. 6). Differs in being larger and that the ocellar interval is invariably dark brown. The terminal segments including the gonapophyses appear almost identical with *aurantiacus*.

## Male:

Length of body 2.0 mm. ave. of 4 individuals.

Length of fore wings 3.4 mm. ave. of 5 individuals.

Length of antennæ 3.1 mm. av. of 4 individuals.

In general similar to female, with the usual differences in size, eyes and antennæ; wings deeply colored. Genitalia resembling *cræsus*; the structure lying between the parameres weakly chitinized, consisting of several indistinct lobes but not resembling the letter  $\gamma$ .

Colorado: Pingree Park, Aug. 20, 1924, 20 ♀ 7 ♂ (C. R. C.).  
Holotype (♂), Allotype and Paratypes; Cascade, Aug. 28, 1924,  
1 ♀ (C. R. C.).

Wyoming: Yellowstone National Park, 24 ♀ 2 ♂; Aug. 27 to  
31, 1927 (C. R. C.).

Alberta (Canada): Sulphur Mts., Banff, Aug. 2, 1927, 5 ♀ 3 ♂  
(Eugene Crosby).

**Cæcilius pinicola** Banks

*Cæcilius pinicola* Banks. N. Y. Ent. Soc. Jour. 11: 238. 1903.

## Female:

Length of fore wings 2.9 mm. ave. of 10 individuals.

Length of body 2.3 mm. ave. of 4 individuals.

Length of antennæ 2.1 mm. ave. of 5 individuals.

Head and thorax a pale tan throughout, abdomen white.

Head uniformly pale tan with the only distinct markings a *pair of large reddish brown spots between ocelli and antennæ*. Ocellar interval deep brown. Only a faint indication of dotted areas on vertex and lineation on clypeus. Maxillary palpus and antennæ tan, the latter deeply colored. Eyes dull bluish black.

Thorax, including legs, concolorous with head throughout, usually without any deeper pigmentation on tergal lobes. Wings a uniform tan ranging almost to a salmon. Pterostigma only moderately deep, rounded; the cell is thickened, opaque, pale. Veins uniformly pale, practically concolorous with the cells. Abdomen white. Genitalia weakly chitinized, structures not readily distinguishable in unstained material and essentially identical with *aurantiacus* in form.

## Male:

Length of fore wing 2.8 mm. ave. of 4 individuals.

Length of body 1.8 mm. ave. of 4 individuals.

Length of antennæ 2.3 mm. ave. of 3 individuals.

Differing from female in that eyes are about two times larger, characteristic pair of reddish brown spots on vertex not as distinct, antennæ stouter and abdomen slender curved upward. Genitalia weakly chitinized closely resembling *aurantiacus*; no structure (except possibly the sense tubercles on paraprocts) readily visible in unstained material. Hypandrium pilose laterally but also slightly so proximally. The paramere-penis ensemble resembles *perplexus* rather than *aurantiacus* being very weakly chitinized and the penis located at a pair of elongate closely appressed lobes which are widest proximally tapering to a blunt point distally.

The presence of the reddish brown spots on the vertex was the only character found that serves to separate the species readily from others with tan or orange wings about 3 mm. long.

Virginia: Caret, Oct. 28, 1926, 1 ♂ (C. & B.); Falls Church, Oct., 1 ♀ M. C. Z. Holotype.

North Carolina: Base of Mt. Pisgah, Oct. 19, 1924, 1 ♀, Oct. 13, 1926, 3 ♀ 2 ♂ (C. & B.); Yadkinville, Oct. 9, 1923, 1 ♀ (C. R. C.); Madison, Oct. 8, 1923, 3 ♀ (C. & B.). In a dry pine wood.

Florida: The Glen, Marion Co., March 6, 1927, 3 ♀ (M. D. Leonard); Rock Bluff, April 4, 1927, 1 ♂ (C. R. C.).

Georgia: Top of Blue Ridge, Towns and Rabun Co. line, Oct. 18, 1926, 4 ♀ 1 ♂ (C. & B.).

### *Cæcilius posticus* Banks

*Cæcilius posticus* Banks. Acad. Nat. Sci. Phila. Proc. **66**: 1914, 612. Pl. 28, Fig. 15.

Female (*subapterous*):

Length of body 2.2 mm. ave. of 6 individuals.

Length of antennæ 2.0 mm. ave. of 4 individuals.

Head dark brown; in distinct contrast to the yellowish white abdomen and the lighter brown thoracic segments and genitalia.

Pigmentation slightly paler on vertex behind eyes; a more constant pair of triangular paler area between ocelli and base of antennæ. Epicranial suture distinct to ocelli and terminating there. Head rather narrow between eyes, flat, elongate. Clypeus, genæ and labrum uniformly dark brown except the

first may be faintly lineate in teneral individuals. Maxillary palpus pale. Antennæ pale brown fading to white distally. Eyes dull bluish black.

Thorax: Segments light brown, prothorax almost equalling other segments in size. Tergum of mesothorax twice the size of other segments. Wings reduced to minute white, slightly pilose buds. Those on mesothorax extending caudally to posterior margin of metathorax and covering the much smaller wing buds on this segment. Legs pale brown throughout.

Abdomen: Large, dull white, with broad faint stripes of orange. An elliptical thickened spot between fifth and sixth sternites. Genitalia brown (Pl. XVI, Fig. 9) distinct. Subgenital plate triangular with a pair of wide lateral stripes widening and then converging apically just behind the blunt pointed membranous non-pilose apex. The subgenital plate covered with short hairs which extend to the end of the chitinization. The gonapophyses consist of two small extremely slender pointed blades which arise at right angles to elongate parallel processes from the tergite. Sense tubercles small, brown,—located on proximo-dorsal portion of paraprocts. These pieces with lateral surface definitely chitinized, not strongly pilose. Suranal plate semicircular, chitinization increasing laterally where there are a number of large spines at or near distal margin.

Female (*macropteros*):

Length of fore wing 2.3 mm. °

Length of body 2.1 mm.

Length of antennæ 2.1 mm.

Essentially the same as *subapterous* individuals. The pterothorax is of course very large, the prothorax small. The wings are subhyaline and not as strongly marked with brown as the male.

Male:

Length of fore wings 2.0 mm. ave. of 6 individuals.

Length of body 1.9 mm. ave. of 6 individuals.

Length of antennæ 2.3 mm. ave. of 3 individuals.

Marked as female, eyes of about equal size. The wings (Pl. XXI, Fig. 20) narrow, subhyaline, strongly marked with brown.

Pterostigma long, of moderate depth distally, rounded, white. Pale or unpigmented areas occur just below and for the length of pterostigma, in distal half of cell  $R_5$ , most of  $R_3$  and  $Cu_1$ , on each side of first anal vein and bordering proximal half of costal margin of wing. Veins coarse light brown;  $R_{2+3}$  comes unusually close to  $R_1$  at wing margin. Hind wing fumose. The hairs, at wing margin especially, long.

Abdomen: The ventral thickening on 5th and 6th segments prominent. Genitalia (Pl. XVI, Fig. 11) distinct, similar to *aurantiacus*. Between the parameres a pair of lateral plates (edge uppermost viewing structures *in situ*) and a circular thickening ventrally attached to which a pair of elongate lobes which are closely appressed for two-thirds their length distally. The hypandrium with wide distal margin strongly chitinized laterally. Attachment to tergites weakly chitinized, rather narrow. Hypandrium pilose; hairs longest laterally and especially at distal margin, laterally. Paraprocts similar to female; suranal plate narrower.

New York: Sea Cliff, L. I., Aug. 1 ♂ (N. Banks) M. C. Z. Holotype. Wading River, L. I., Sept. 19, 1926 4 ♀ (*subapterous*) 4 ♂ 5 nymphs (writer and A. M. Boyce). In dry oak leaves on ground. Allotype. Baiting Hollow, Suffolk Co., L. I., Sept. 19, 1926 4 ♀ (*subapterous*) 2 ♂ (writer and A. M. Boyce). In dry oak leaves on ground; Hunter, Aug. 16, 1925 3 ♀ (*subapterous*). On stones, associated with *Bertkavia lepidinaria*; Freeville, Oct. 12, 1924 1 ♀ (*subapterous*) (C. R. C.) sifting leaves; Clarksburg, Sept. 18, 1925 1 ♀ (*subapterous*) (C. R. C.) sifting leaves; Penn Yan, Aug. 2, 1925 3 ♀ (1 *macropterous*, 2 *subapterous*).

Maine: Sebasticook Lake, Aug. 24, 1925 1 ♀ (*subapterous*) (C. R. C.).

Connecticut: Wachogastricook Creek, Salisbury, June 29, 1930, 5 ♀ (1 *macropterous*, 4 *brachypterous*).

#### *Cæcilius quillayute* new species

Female:

Length of body 2.2 mm. ave. of 5 individuals.

Length of fore wings 3.25 mm. ave. of 5 individuals.



Resembles *aurantiacus* from which it may be distinguished as follows: most of the vertex and front and all of the clypeus a uniform pale brown or buff; interval between ocelli white; tergal lobes concolorous with markings on head; a rather wide unmarked band midway proceeding well into the median lobe of the mesothorax. The wings (Pl. XXI, Fig. 21) pale brown or salmon, the veins are slender and not margined with brown and while the veins are palest basally there is no strong contrast between the proximal and distal parts as in *aurantiacus*. Cell 2A brown.

The genitalia are definitely chitinized in parts making the *ensemble* much more distinct than in *aurantiacus*. (Pl. XVI, Fig. 1). The subgenital plate bears a pair of lateral chitinized strips while the distal part is produced into a pair of lobes with a median depression. This distal portion strongly pilose. Gonapophyses consist of two pairs of slender blades: the ventral pair more or less indefinite in outline distally while the more caudal pair bear an elongate lobe on the *proximo-caudal* margin (and which bears one or two hairs distally). The paraprocts pilose distally and likewise an area midway between the sense tubercles and the mesal surface. Suranal plate lobe-like slightly tuberculate and almost non-pilose.

Male:

Length of body 1.8 mm. ave. of 5 individuals.

Length of fore wings 3.0 mm. ave. of 5 individuals.

Closely resembles female. Eyes much larger. Abdomen slender, curved upwards. The genitalia similar to male of *aurantiacus*, especially the ensemble penis and claspers.

Washington: La Push, Aug. 10, 1927 24 ♀ 5 ♂ (C. R. C.) Holotype (♀) Allotype, Paratypes; Lake Sutherland, Aug. 10, 1927 1 ♀ (C. R. C.) Paratype; Longmire, Aug. 22, 1927 1 ♀ (C. R. C.) Paratype; Sol Duc Hot Springs, 7 ♀ 2 ♂ Aug. 12, 1927 (C. R. C.) Paratypes.

***Cæcilius citricola*** (Ashmead)

*Psocus citricola* Ashmead. Can. Ent. **11**: 228. 1879.

I have been unable to find the type specimens of this Florida species. From its size (.10 to .12 in.) and coloration, as given by Ashmead, it appears to belong to *Cæcilius* or *Lachesilla*. I tentatively place in it *Cæcilius*.

***Cæcilius subflavus*** Aaron

*Cæcilius subflavus* Aaron. Acad. Nat. Sci. Phila. Proc. **38**: 13. 1866.

It was not possible to make a critical study of this species. Type locality "Southern Texas."

*Pseudocæcilius* Enderlein

*Pseudocæcilius* Enderlein. Ann. Mus. Nat. Hung. 1: 260. 1903.

In *Pseudocæcilius pretiosus* Banks individuals are found with a distinct r-m cross vein in fore wings and all gradations up to those where R and M are fused for a short distance. Enderlein assigns species where the cross vein is distinct to *Ptilopsocina*. I am including psocids with *Cæcilius*-like wing-venation in this genus where cell  $Cu_1$  is elongate and flattened, r-m cross vein present or not, veins and wing margin bearing long hairs, *pterostigma non-angulate, non-pilose*, and veins in apical portion of hind wings and at wing margin pilose. The female genitalia in *P. pretiosus* not greatly reduced as in *Cæcilius*, three pairs of gonapophyses present. It is not clear how this genus is distinct from *Epipsocus* Hagen. In the genotype *E. ciliatus*, Hagen shows a long r-m cross vein and a pubescent pterostigma (Stett. Ent. Zeit. 1882: Taf. 1, fig. 4). Enderlein describes four new species in erecting *Pseudocæcilius*; no genotype was designated. In the species appearing first, *elutus* and *testaceus*, the pterostigma is non-pubescent, in the other two the pterostigma is figured with hairs.

***Pseudocæcilius pretiosus* (Banks)**

*Cæcilius pretiosus* Banks. Mus. Comp. Zool. Bul. 64: 311. 1920.

*Pseudocæcilius wolcottii* Banks. Mus. Comp. Zool. Bul. 65: 423. 1924.

Female:

Length of wings 2.65 mm. ave. of 10 individuals.

Length of body 2.5 mm. ave. of 10 individuals.

Length of antennæ about 2.5 mm.

Mostly creamy white throughout. A constant fuscous stripe running through the pleuræ of the thorax continuing on head through eyes to antennæ.

Head unmarked except for faint indication of orange dots in usual position on vertex and the lineation on clypeus. Maxillary palpus and antennæ concolorous with head. Eyes dull black.

Thorax: A light brown V on each segment above. Pleuræ with fuscous stripe midway. Legs pale throughout. Wings (Pl. XXI, Fig. 1) hyaline with several light brown spots. Pterostigma very long and shallow, opaque, with a pale brown spot distally, R white. Central half of cell Cu light brown, the pigmentation extending up to vein M; a small spot in distal end of anal cells. Veins coarse, pale proximally, brown in distal third of wing. Proximal to their junction, Rs and M brown (forming a V); a tendency toward union of these veins by r-m cross vein although R is frequently fused to M for a short distance. Hairs on veins and wing margin long, stout. Hind wings unmarked, veins pale.

Abdomen white with a few purplish grey stripes on dorsum. Genitalia weakly chitinized, structures not readily visible in unstained material. The basal portion of sub-genital plate (Pl. XVII, Fig. 6) about one-third as deep as wide. At proximal margin a triangular pilose area; distal margin bent to give rise to an egg-guide. This piece produced distally into a pair of lateral lobes each bearing a single spine; the egg-guide comes to a blunt point between the lobes so that the distal margin forms the letter W. A weak V-shaped plate lies beneath the egg-guide. Three pairs of gonapophyses present. The lateral pair large, swollen and lobe-like; attached broadly with the blunt pointed distal portion extending over the egg-guide; a few (about six) long spines adorn the structure. The ventral and dorsal gonapophyses of similar shape, being fleshy, slender, curved with a median, slightly chitinized "core," twisted and flattened. Distally they fork slightly. The dorsal gonapophyses bear an inconspicuous row of minute hairs distally and one or several apical teeth.

Sense tubercles of paraprocts small, much elevated proximally. Hairs at distal margin long, numbering about seven or eight. Suranal plate wide with a row of eight stout spines at distal margin.

Florida: Orlando, June 4, 1926 32 ♀ many nymphs. Common on citrus (M. D. Leonard); January, 1927 4 ♀ and May, 1927 1 ♀ (O. C. McBride).

Texas: San Antonio, 3 ♀ M. C. Z. Holotype and Paratypes; (1 ♀ Paratype kindly supplied for critical study by Nathan Banks).

Dist. of Columbia: Washington, Oct., 4 ♀. In hot house. Paratypes M. C. Z.

Porto Rico: 3 ♀ (G. N. Wolcott) Holotype and Paratypes of *Pseudocæcilius wolcotti* Banks; San Juan, 1 ♀ April 10, 1923 (G. N. Wolcott) Paratype (?) kindly supplied by Nathan Banks for critical study.

### *Pseudocæcilius* (?) *clarus* (Banks)

*Cæcilius clarus* Banks. Am. Ent. Soc. Trans. **34**: 258. 1908.

No careful study was made of this species. Because wing venational characters and wing pubescence resemble *P. pretiosus*, *clarus* is tentatively placed here. The pterostigma is transparent and, I believe, nonpilose. R is joined to M for a considerable distance in the holotype. Wing length 2.9 mm. Wing markings similar to *pretiosus*. The head a dull sulphur-yellow, with a few obscure marks on vertex.

California: Berkeley, 1 ♀ on bay laurel M. C. Z. Holotype.

### *Teliapsocus* new genus

Genotype: *P(socu)s conterminus* Walsh 1863.

Related to *Kolbea* Bertkau, differing principally in the disposition of hairs on the wings. In *Teliapsocus* large stout hairs are found along the veins *but also in the cells in proximal half of the wings and in pterostigma*. Only a few large hairs occur in the distal half of wings while the wing margin is sparsely clothed with much shorter hairs. *Hind wings unhairied* except for a few at the margin in the apex. Cell  $Cu_1$  is large, deep; vein  $Cu_1$  almost touching M. *Brachypterous* females of *T. conterminus* have been taken.

The terminal abdominal segments and genitalia resemble *Cæcilius*: only one representative of *Teliapsocus* has been found in the United States. It is easily distinguished from others of the family Cæciliidæ.

### *Teliapsocus conterminus* Walsh

*P(socu)s conterminus* Walsh. Ent. Soc. Phila. Proc. **2**: 185. 1863.

*Psocus canadensis* Provancher. Nat. Canad. **8**: 177. 1876.

*Cæcilius definitus* Aaron. Am. Ent. Soc. Trans. **11**: 38, Pl. 9, Fig. 4. 1883.

*Elipsocus conterminus* Hagen. Verh. zool.-bot. Ges. Wein. 16: 207. 1866.

Female (*macropterosus*):

Length of body 3.8 mm. ave. of 8 individuals.

Length of fore wings 4.25 mm. ave. of 8 individuals.

Length of antennæ 2.9 mm. ave. of 7 individuals.

Head: Vertex covered with coarse fuscous markings; ocelli enclosed in a blackish spot; a U-shaped brown spot on front; clypeus short, wide, much swollen; lineated with mesally directed lines which are dark fuscous anteriorly, then tan, and finally fading out posteriorly; in some individuals the lines merge posteriorly; labrum tinged with tan and brown; genæ white with a black spot below antennæ and a similar one on maxillæ at base of maxillary palpus. Maxillary palpus white except the distal two-thirds of last segment which is brown. Antennæ brown paling proximately to faint tan or white; segments 1-4 distinctly pale with a brown ring distally on segments 3 and 4. Eyes small, dull black.

Thorax: Tergal lobes shining black, sutures white. Pleuræ white with large conspicuous black spots distributed as follows: one just below attachment of each wing; one above coxa of mesothoracic leg; one on each of coxæ. Legs: femora white with a few brown dots on outer surface; tibiæ white touched with brown proximally and distally; tarsi brown, darkest distally. Wings (Pl. XX, Fig. 29) hyaline with only small touches of brown. Pterostigma opaque; a narrow band of brown at apex and base of cell; a faint incomplete band of light brown extending from end of anal veins to base of Rs. Veins distinct, dark brown in distal half of wing, pale brown basally.

Abdomen conspicuously white with greyish and reddish brown stripes on tergum while the 9th tergite almost completely covered with two pairs of blackish spots. Subgenital plate (Pl. XVI, Fig. 8) dark brown resembling the letter  $\pi$  in shape. The ventral gonapophyses short, the Y-shaped gonapophyses probably represent the united lateral and dorsal gonapophyses. Sense tubercles of paraprocts white and likewise the paraprocts while at its apex three conspicuous spines, the middle one short.



Suranal plate short, triangular, white; with a pair of stout spines apically.

Female (*brachypterous*):

Length of fore wings 1.0, 1.7, 1.6 mm. Measurements of 3 individuals.

The venation of these reduced wings may usually be recognized as that of *Teliapsocus* but aberrations are common. The hairs are distinct, both those on the veins and on cells  $Cu_1$  and  $A_1$ .

Male:

Length of body 2.75 mm. ave. of 8 individuals.

Length of fore wings 4.35 mm. ave. of 8 individuals.

Length of antennæ 4.1 mm. ave. of 6 individuals.

Resembles female in markings, much less robust, abdomen slender. Eyes larger but not twice the size of female. Antennæ brown throughout, palest at base, not more pilose than female but stouter.

Genitalia (Pl. XVI, Fig. 4) symmetrical. Hypandrium roughly triangular, chitinization V-shaped. Parameres similar to *Cacilius*. Suspended between these pieces a concave triangular piece—(the penis?). Paraprocts similar to female in that the sense tubercles are white and that similar spines appear at the apices of the structures.

New York: Chapel Pond, Essex Co., July 19, 1925, 3 *brachypterous* ♀ (S. C. Bishop); Sea Cliff, L. I., 1 ♂ (Banks) M. C. Z.

Quebec, Canada: 1 ♀ (Provancher) M. C. Z. Paratype of *Psocus canadensis*?

Maine: Winterport, Aug. 29, 1925, 1 ♀ (C. R. C.).

Massachusetts: 4 ♀ M. C. Z.

Connecticut: Bear Mt. 2300 ft. elevation, Salisbury, Aug. 22, 1902, 1 ♂ (A. P. Morse) M. C. Z.

Maryland: Plummers Island, Aug. 21, 1 ♀ M. C. Z.

Virginia: Caret, Oct. 28, 1926, 2 ♀ (C. & B.); New Market, Oct. 4, 1926, 1 ♂ (C. & B.).

Kentucky: Quicksand, June 25, 1925, 1 ♀ misc. beating.

North Carolina: North Fork Swannanoa, Black Mts., 1 ♀ M. C. Z.; Bridgewater, Oct. 14, 1923, 1 ♀ (C. R. C.); Blowing Rock, Oct. 10, 1923, 2 ♀ (C. R. C.).

Georgia: Spring Creek, Seminole Co., Apr. 11, 1927, 2 ♂ (C. R. C.); Tiger, Oct. 18, 1926, 3 ♀ (C. & B.).

Florida: Orlando, Aug. 2, 1927, 4 ♀; Jan., 1927, 2 ♀ (O. C. McBride).

Wyoming: East Entrance to Yellowstone Park, Aug. 31, 1927, 12 ♀ 6 ♂ (C. R. C.).

Washington: Longmire, Aug. 22, 1927, 12 ♀ 1 ♂ (C. R. C.).

In 1863 Walsh described *Psocus conterminus*, and, although the types are non-existent, the species is readily recognizable from his description. He made clear that cell  $Cu_1$  was not joined to M and was "nearly in the shape of an equilateral triangle." This places it in the *Caciliidæ*. Walsh gives the length of *conterminus* as 4.5 mm., which point alone is sufficient to distinguish it from other North American *Caciliidæ*. Provancher in 1875 described *Psocus canadensis*. This is a synonym of *T. conterminus*: the description fits and in the Museum of Comparative Zoology there is a specimen "*Elipsocus canadensis* Prov." labelled apparently by Hagen, "Quebec, Prov." "397" and which is unmistakably *T. conterminus*. Hagen erroneously assigned *contermina* to *Elipsocus* thinking it had three jointed tarsi; and Banks likewise lists it, and its two synonyms, as distinct species of *Elipsocus* in his catalogue. *Cacilius definitus* Aaron is a male of *T. conterminus*.

### Polypsocus Hagen

*Polypsocus* Hagen. Verh. zool.-bot. Ges. Wein. **16**: 203. 1866.

*Ptilopsocus* Enderlein. Zool. Jahrb. Syst. **14**: 153. 1900.

Type: *P. corruptus* Hagen. 1861.

The unusual shape cell  $Cu_1$  caused Hagen to erect the genus *Polypsocus* for the inclusion of the single species *P. corruptus* Hagen. Vein  $Cu_1$  parallels the wing margin for a considerable distance causing cell  $Cu_1$  to be very large. Wing margins, veins, pterostigma and cells in apex of wing, near margin, covered with hairs. The genitalia show an affiliation to *Teliapsocus*, *Cacilius* and *Graphopsicus*.

### *Polypsocus corruptus* Hagen

*Psocus abruptus* Hagen. Syn. Neuropt. of N. A., p. 13, 1861.

*Psocus corruptus* Hagen. Syn. Neuropt. of N. A., p. 13, 1861.

*Polypsocus corruptus* Hagen. Verh. zool.-bot. Ges. Wein. **16**: 211. 1866.

*Ptilopsocus annulicornis* Banks. Jour. N. Y. Ent. Soc. **11**: 238. 1903.

Female:

Length of body 3.1 mm. ave. of 10 individuals.

Length of fore wings 3.65 mm. ave. of 10 individuals.

Length of antennæ 3.0 mm. ave. of 10 individuals.

This striking psocid is readily recognized by the shining bronze wings with the hyaline band near their apex.

Head: Uniformly dull tan, mouthparts pale; a pair of dark stripes run between the base of antennæ and eyes, continuing and widening behind the eyes. Maxillary palpus tan, pale distally. Compound eyes dull bluish black. Antennæ with segments 1-4 hyaline and the remaining with a distal portion brown, the proportion of the segment colored increasing progressively, distally.

Thorax: Dorsum ranging from tan to brown, darkest anteriorly on median tergal lobe. On pleuræ a continuation of the dark fuscous stripe on head. Prothorax white below this stripe. Meso- and metathoracic legs with brown on the coxæ; femora brown, tibiæ and tarsi pale, nearly white but the tarsal claws brown. Fore wings (Pl. XXI, Fig. 12) uniformly shining dark brown except for a distinct hyaline band at the apex of the wing which would be crescent shaped, except that the extreme apex of the wing is brown. A small white spot at base of pterostigma, cells otherwise darker than remainder of wing. Veins coarse, inconspicuous. Hind wings paler, greyish brown, darkest marginally in apical third of the wing.

Abdomen: Usually a purplish grey; dorsum palest, quite pale or nearly white above in some individuals. Genitalia (Pl. XVI, Fig. 12) brown. Chitinized portion of subgenital plate V-shaped. A strip of purplish pigment, alongside each arm. The gonapophyses reduced to a single pair consisting of a lobe-like basal portion and stiletto-like distal part, while fused to their mesal margins is the interior genital plate thus making a continuous piece beneath the subgenital plate. Sense tubercles of

paraprocts large. Suranal plate long, rather narrow, truncate with distal margin strongly pigmented.

Male:

Length of body 2.45 mm. ave. of 10 individuals.

Length of fore wings 3.65 mm. ave. of 10 individuals.

Length of antennæ 3.7 mm. ave. of 8 individuals.

Hyaline portions on fore wings (Pl. XXI, Fig. 13) consistently differing from female as follows; a pale area midway, roughly diamond shaped with the extreme angles at the base of pterostigma and at  $Cu_1$ ; the hyaline area at the tip of wing triangular with its base at the costal margin and the apex about halfway across wing. Compound eyes slightly ovate, extremely large, several times larger than female's. Antennæ stouter than female, segment 1 and 2 brown and with gradually increasing amounts of brown distally.

Abdomen usually white with the genitalia brown (Pl. XVI, Fig. 7). Hyandrium short, basal margin wide, straight across; definitely chitinized laterally but a weakly chitinized diamond shaped portion lies mesally. On hyandrium long hairs laterally, short hairs mesally. The parameres as in *Cacilius*; suspended between these lie pieces consisting of two pairs of lateral hooks and a single distal hook. Sense tubercles large, occupying the proximal two-fifths of chitinized part of paraprocts. Suranal plate small, blunt pointed, with a proximal weakly chitinized crescent.

New York: Ithaca, July 11, 1926, 13 ♀ 12 ♂ in dead leaves on fallen beech tree, Sept. 6, 1926, 19 ♀ 5 ♂ in dead beech leaves; Enfield Glen, Tompkins Co., Aug. 23, 1925, 7 ♀ 3 ♂ 5 nymphs; Sea Cliff, L. I., 3 ♀ 2 ♂ (Banks) M. C. Z.

New Hampshire: Berlin Falls, Aug. 12, 1 ♀ M. C. Z.; Franconia, 1 ♀, M. C. Z.

Pennsylvania: Pennsylvania Mts., 1860, 2 ♀ 1 ♂ (O. Sacken) M. C. Z.

Massachusetts: 1 ♀, M. C. Z.

Wisconsin: Polk Co., July, 1 ♀ 2 ♂ (Baker) M. C. Z.

Illinois: Rock Island, 1860, 2 ♀ 1 ♂ (Walsh) M. C. Z.

Virginia: Falls Church, June 8, 1 ♂. Holotype *Ptilopsocus annulicornis* Banks, Sept. 3, 8 ♀ 2 ♂, Aug. 27, 1 ♀ (Banks) M. C.



Z.; Great Falls, July 21, 1 ♂ (Banks) M. C. Z.; Delaplane, Sept. 10, 1 ♀ (Banks) M. C. Z.; Glencarlyn, May 9, 3 ♂ (Banks) M. C. Z.

Maryland: 1860, 1 ♀ (Uhler) M. C. Z.

District of Columbia, Washington: 1858, 2 ♀ 1 ♂ (O. Sacken). Types M. C. Z., 1 ♀, July 21 (Banks) M. C. Z.

Kentucky: May, 1 ♀ (Sanborne) M. C. Z.

North Carolina: Blowing Rock, Oct. 10, 1923, 5 ♀ 5 ♂ (C. & B.).

Tennessee: Mill Creek, below falls on Mt. Leconte, Oct. 10, 1926, 12 ♀ 12 ♂ (C. & B.).

Georgia: Dalton, 1859, 2 ♀ 1 ♂ (O. Sacken) Types M. C. Z.; Clarksville, Aug. 10, 1909, 1 ♀ 1 ♂ M. C. Z.

Washington: Seattle, Aug. 7, 1927, 1 ♀ (C. R. C.); Lake Sutherland, Aug. 10, 1927, 2 ♂ (C. R. C.).

The difference in markings in the sexes, especially the markings of the fore wings, caused Hagen to name the female *Psocus abruptus* and the male *Psocus corruptus*. Later he decided they were one species and not congeneric with *Psocus*. He then erected the genus *Polypsocus* with *corruptus* as the genotype. *Ptilopsocus annulicornis* Banks is a male *corruptus*.

Dead leaves of deciduous trees are known to be a favorite feeding and breeding ground of this handsome species. The writer has found oak and beech leaves so inhabited both on the ground or when still attached to a fallen tree or broken branch. A slight webbing encloses their home. *P. corruptus* also occurs on tree trunks, cliff walls and elsewhere. Two broods or more are found in New York State.

### Graphopsocus Kolbe

*Graphopsocus* Kolbe. Jahresber. Westfäl. Ver. Wissens. 8: 125. 1880.

Type: *G. cruciatus* L. 1768.

In the fore wings of *Graphopsocus*, cross-veins r and m-cu are present and the wing margin is non-pubescent. These characters readily distinguish the genus. The genitalia are very similar to *Cacilius*, *Teliapsocus* and others. Enderlein has consistently grouped *Graphopsocus* and the related genus *Stenop-*



*socus* Hagen 1866, under the Psocidæ. The genitalia, however, are so similar to the Cæciliidæ that it appears to be more properly placed in that family than in Psocidæ.

**Graphopsocus cruciatus (Linne)**

*Hemerobius cruciatus* Linne. Syst. Nat. Ed. 13, T. 3, App., p. 225. 1768.

The synonymy is listed in Cat. Coll. Selys. Longchamps Fasc. 3. Pt. 2, p. 13. 1915.

Female:

Length of body 2.35 mm. ave. of 10 individuals.

Length of fore wings 2.9 mm. ave. of 10 individuals.

Length of antennæ 2.8 mm. ave. of 8 individuals.

Readily recognized by the wing markings which consist of three bands of light brown in the distal half of the wing and four large dark brown spots in proximal half.

Head: Vertex tan, marked with elongate brown dots: just behind the ocelli a pair of dotted areas composed of three or four dots; the marginal area marked with dots thus leaving a large unmarked area on each side of epicranial suture. Most of front covered by about four brown dots; a white area surrounding the antennæ, includes the anterior third of the genæ and anterior third of clypeus (half of clypeus laterally). Posteriorly the clypeus brown, lineated with broad broken lines of dark brown. Labrum touched with brown deepening mesally, with a triangular white area midway anteriorly; posterior two-thirds of genæ brown. Maxillary palpus pale, darkest proximally. Antennæ brown distally, with a gradual paling proximally so that segments 1 and 2 are white. Eyes dull black.

Thorax: Tergal lobes dark brown. On the pleuræ the epimerum and coxæ of the mesothorax brown while the sides are otherwise white or inconspicuously touched with brown and in other individuals the coxæ of the metathorax are brown. Legs: femora white, tibiæ and tarsi light brown. Wings hyaline (Pl. XX, Fig. 30) fore wings strikingly marked as figured. Veins pale proximally, brown distally. Hind wings hyaline, clouded with pale brown areas which correspond generally to the markings of fore wings. These markings are more distinct proxi-

mally while the most proximal of the spots in the anal area is dark brown.

Abdomen white, pale straw yellow or gray below. Genitalia (Pl. XVIII, Fig. 13) distinct. The subgenital plate an inverted U in shape with the arms slightly spread. The distal margin is broad, slightly concave, strongly chitinized. Ventral gonapophyses, short, slender, stiletto-shaped, obscured by the subgenital plate under which they lie. Apparently the dorsal and lateral gonapophyses combined in the pair of slender, stiletto-like rods with the elongate blunt-pointed portion arising proximally from the dorsal margin. Paraprocts and suranal plate weakly chitinized; sense tubercles on the former inconspicuous, with the latter structure triangular in outline.

Male:

Length of body 1.9 mm. ave. of 4 individuals.

Length of fore wings 3.05 mm. ave. of 5 individuals.

Length of antennæ 3.05 mm. ave. of 5 individuals.

Resembles female, but with these differences: body less robust; antennæ more robust but not more pilose; eyes large, slightly ovate, more than twice as large as females; markings paler, less distinct, especially on head and on wings; abdomen slender, curved upward.

Genitalia (Pl. XVI, Fig. 6) symmetrical. Parameres as in *Cacilius*. An indistinct triangular concave structure suspended between the parameres. Hypandrium wide, definitely chitinized, (usually chitinization fades out mesally), bearing a distinct distal portion elliptical in outline and with a pilose strongly chitinized distal margin. Caudo-mesally on the 9th tergite a pair of slender pointed, mesally directed processes. Sense tubercles on the paraprocts proximal, large, distinct. Suranal plate short, membranous, triangular.

Maine: Bar Harbor, June 22, 1922, 1 ♀ (C. W. Johnson).

Washington: Seattle, Aug. 7, 1927, 13 ♀ 3 ♂ (C. R. C.). Edmonds, Aug. 16, 1927, 7 ♀ 1 ♂ (C. R. C.).

Germany: Saxony, 1 ♂ (Rostock). Supplied by M. C. Z.

This is believed to be the first American record of this species. It is common and widely distributed in Europe. *G. cruciatus* is probably not indigenous to America—at least to Eastern United

States—or it should have been found before 1922 when Mr. C. W. Johnson took it at Bar Harbor, Maine. In Washington, Prof. C. R. Crosby took specimens at Seattle and nearby at Edmonds; he was unable to find it in more isolated localities. Can these Washington specimens be representatives of an introduction from Japan or elsewhere in the Orient? (*G. cruciatus* is recorded in Japan.) The Museum of Comparative Zoology gave the author a male of this species taken in Germany. A critical examination of this specimen causes me to conclude that the American specimens are conspecific with it.

#### **Terracæcilius** new genus

Type *T. pallidus* new species.

Female subapterous, the wings reduced to a single pair on the mesothorax. Male unknown. Thorax reduced, mesothorax slightly larger than the other two segments. Tarsi two-jointed. Legs not armed with ctenidia. Head broad, rather flat; ocelli apparently non-functional, being represented by three dark dots in a depression. Epicranial suture fading out at this depression. Buccal rods slender, forked apically. Genitalia resembling *Lachesilla*. The gonapophyses reduced to a single pair of arm-like pieces. Sense tubercles of paraprocts wanting.

#### **Terracæcilius pallidus** new species

Female:

Length of body 2.2 mm. ave. of 7 individuals.

Length of antennæ 2.0 mm.

Head, abdomen and genitalia dull orange; abdomen paler, sternites conspicuously marked with greyish brown stripes at the sutures. Head deep orange above, paling at the genæ; clypeolus and also a V-shaped mark on the vertex, unmarked; on clypeus barely distinguishable, broad, mesally directed lines. Antennæ clothed with a few long hairs; concolorous with head together with maxillary palpus. Eyes small, dull bluish black.

Thorax: Pleuræ paler than dorsum. Wings elongate, blunt pointed apically, convex, thickened and covered with minute spines. Legs pale, concolorous with pleuræ. Tarsal claws short.

Genital processes (Pl. XVII, Fig. 7). Subgenital plate a large, V-shaped plate with a blunt-pointed, weakly chitinized apex. The single pair of gonapophyses stout, convex, blunt-pointed arms. They are sparsely pilose. Paraprocts triangular, pilose in distal half with a weakly chitinized spot at the apex. The chitinization extends beyond distal edge to form a crescent-shaped part there. Suranal plate isosceles trapezoidal with the distal margin gently rounded and pilose; proximally a thin non-chitinized crescent.

New York: Ithaca, July 12, 1925, 12 ♀ Holotype and Paratypes; Clarksburg, Sept. 18, 1925, 1 ♀, sifting leaf mold (C. R. C.); Barcelona, Sept. 19, 1925, 1 ♀ sifting leaf mold (C. R. C.).

Tennessee: Mill Creek, below falls on Mt. Leconte, Oct. 10, 1926, 2 ♀ (C. R. C.).

*Lachesilla* Westwood

*Lachesilla* Westwood. Introd. Class. Ins. 2: 19, 1840.

*Pterodela* Kolbe. Jahresber Westfäl. Ver. Wissens. 8: 118. 1880.

Type: *L. pedicularia*, 1758.

Wing venation as in *Cæcilius* from which *Lachesilla* differs in that the veins and wing margin are non-pilose. The genitalia are considerably different from the other members of the subfamily. In the female appears, usually, a single pair of arm-like gonapophyses; the interior genital plate is frequently distinct, and the genital structures generally, are readily visible. The male genitalia present such a great variety of form that it is difficult to homologize the several elements. A pair of stout claspers arising from the tergum or sometimes fused to the hypandrium is rather constant. A chitinized structure lying mesally below the hypandrium is considered homologous with the true parameres in other genera. It differs from the fused parameres of other genera, among other things, in the proximal portion not being paired. It hardly seems to qualify as a true penis.

Species of *Lachesilla* inhabit dead and dying leaves, but some, like *L. pedicularia* L. are found in a great variety of situations.

KEY TO FEMALES OF LACHESILLA

- |  |                 |
|--|-----------------|
| 1—Arm-like gonapophyses present; fore wings unmarked .....   | 3               |
| —Arm-like gonapophyses absent or vestigial; fore wings with brownish spots at ends of veins .....  | 2               |
| 2—Arm-like gonapophyses absent; distal portion of interior genital plate, which is chitinized, W-shaped with the median part drawn out into lateral points .....                             | <i>nubilis</i>  |
| —Arm-like gonapophyses appearing to be absent but very small—only an oval spot at apex readily visible; interior genital plate hexagonal, the four distal angles drawn out into points ..... | <i>punctata</i> |
| 3—Wings with a distinct orange or tan cast but veins almost concolorous; abdomen not striped, usually unmarked; length fore wings about 1.7 mm. ....   | 4               |



- Wings hyaline or with faint orange or tan cast, veins distinct, darker; abdomen usually striped .....5
- 4—Shape of subgenital plate not easily distinguishable in unstained specimens, but an elongate lemon yellow part of the interior genital plate readily visible .....*forcepata* n. sp.
- Outline of subgenital plate distinct, deep narrow cleft midway.  
*contraforcepata* n. sp.
- 5—A short, wide, forked plate medianly, the unbranched basal half fused to subgenital plate; subgenital plate rather indistinct; length of fore wings between 2.2 and 2.8 mm. ....6
- A single slender prong midway distally on subgenital plate; subgenital plate distinctly chitinized, a less highly chitinized diamond-shaped part distally; length of wings about 2.0 mm. ....*corona* n. sp.
- No prong or forked plate fused externally to subgenital plate; either small (length of wings 1.7 mm.) and subgenital plate distinct in outline or wings about 2 mm. long, genitalia as in *forcepata* .....8
- 6—Interior genital plate strongly chitinized, roughly hexagonal; subgenital plate less highly chitinized, strongest laterally; forked plate indistinct, slender; length wings 2.7 mm.; gonapophyses arise directly from the tergite .....*rufa*
- Interior genital plate indistinct, forked plate wide, short; gonapophyses fused to a plate which is probably a continuation of interior genital plate .....7
- 7—Distal half of veins in fore wing brown, in striking contrast to the pale basal portion; length fore wings 2.7 mm.; subgenital plate wide, of definite outline; gonapophyses with nearly circular basal attachment and almost covering plate to which they are fused.....*arida* n. sp.
- Veins pale throughout; length of wings 2.2 mm.; subgenital plate weakly chitinized; plates to which gonapophyses fused extending considerably caudo-laterally from base of gonapophyses.....*silvicola* n. sp.
- 8—Form of subgenital plate readily visible; length of wings 1.7 mm., or shorter .....9
- Form of subgenital plate indistinct, elongate, yellowish portion of interior genital plate visible, length of fore wings 2.0 mm.; abdomen somewhat striped.....*forcepeta* var. *major* n. sp. and n. var.
- 9—Head with the usual group of dotted areas on vertex distinct; wings subhyaline; a small plate with a large triangular cleft basally, fused to apex of subgenital plate below; abdomen not definitely striped.  
*pacifica* n. sp.
- Head uniformly golden brown or dark brown; wings hyaline; abdomen typically ringed with gray .....*pedicularia*

## KEY TO MALES OF LACHESILLA

- 1—Hyandrium greatly reduced; pincer-shaped arms give rise distally to long, slender claspers; fore wings with spots at end of veins.....2
- Hyandrium large, or of moderate size; wings unmarked.....3

- 2—A very large beak-shaped hook on suranal plate; claspers from pincer-shaped arms extremely long and slender, strongly chitinized, sickle-shaped ..... *punctata*  
 —Weakly chitinized ear-like lobes on suranal plate; claspers from pincer-shaped arms weakly chitinized, sword-shaped ..... *nubilis*
- 3—Hyandrium roughly rectangular, about three times wider than long, fused parameres a straight unforked (or not appreciably so) rod, a pair of strong curved claspers arising laterally independent of hypandrium ..... 4  
 —Parameres branched, usually Y-shaped; claspers fused to hypandrium..... 6
- 4—Claspers strongly chitinized, awl-shaped pointing mesally ..... 5  
 —Claspers less strongly chitinized, curved mesally, then arching out so that the foot-like apex points laterally; wings pale orange, veins almost concolorous; length of wings about 1.8 mm.  
*contraforcepeta* n. sp.
- 5—Wings pale orange, veins nearly concolorous; length about 1.6 mm.; claspers wide at the base, distal portion only slightly twisted.  
*forcepeta* n. sp.  
 —Wings subhyaline, veins distinct; about 1.8 mm. long; claspers only moderately wide at base, distal portion much twisted.  
*forcepeta* var. *major* n. sp. and n. var.
- 6—Hyandrium large with narrow basal plate; prongs from hypandrium arising laterally ..... 7  
 —Prongs on hypandrium arising medianly ..... 8
- 7—Hyandrium very large, with a single pair of slender lateral claspers; fused parameres Y-shaped with extremely long slender arms..... *rufa*  
 —Hyandrium deeply notched medianly, two pair of slender lateral claspers; parameres Y-shaped, each arm branching again.  
*corona* n. sp.
- 8—Parameres Y-shaped; a pair of short, sharp-pointed claspers medianly; a single small ventral-pointing hook on suranal plate..... *pedicularia*  
 —Parameres independent, lobe-like; a single spear-shaped clasper medianly with its base consisting of three divisions; a pair of large asymmetrical "horns" on dorsum ..... *silvicola* n. sp.

*Lachesilla arida* new species

Female:

Length of body 2.2 mm. ave. of 4 individuals.

Length of fore wings 2.7 mm. ave. of 4 individuals.

Length of antennæ 2.1 mm. ave. of 4 individuals.

Resembles *silvicola* in general appearance and markings and is closely related to it. Wings hyaline. Veins in proximal half of wing pale yellow, in distal half brown, thus producing a rather unusual contrast. M joined to Cu for a short distance or by a short cross-vein. On the abdomen occur the side markings of grey as in *silvicola* but an occasional dorsal mark may be found.

Genitalia (Pl. XVII, Fig. 8) fairly distinct without staining. Similar to *silvicola* with the following differences: the subgenital plate is of definite outline being very broad but with a basal cleft midway; lateral margin sloping mesally beyond the attachment, while the distal margin is rather narrow, straight across. The pair of gonapophyses large, nearly circular at the base, almost covering the lateral part of the plate to which they are fused; the distal part slender, blunt-pointed and considerably more caudally than mesally directed. Sense tubercles on paraprocts dark purple.

Arizona: Ramsey Canyon, Huachuca Mts., Sept. 2, 1927, 6 ♀, in dead oak leaves (J. D. Hood.). Holotype and Paratypes.

***Lachesilla contraforcepeta* new species**

Female:

Length of body 1.65 mm. ave. of 7 individuals.

Length of fore wings 1.7 mm. ave. of 7 individuals.

Length of antennæ 1.1 mm. ave. of 7 individuals.

Resembles *forcepata* from which it may be distinguished by genitalial characters. Head and thorax tan, abdomen dull white. Head and appendages generally tan with the dotted areas of the vertex a little darker tan; genæ pale; the clypeus indistinctly lined. Antennæ become darker distally. Eyes dull bluish black.

Thorax including legs, tan, rather pale on dorsum, with sutures brown on the pleuræ; femora pale. Wings (Pl. XXI, Fig. 19) unmarked, uniformly faint tan or salmon. Pterostigma opaque, veins inconspicuous, tan. Hind wings almost hyaline.

Abdomen usually dull white, but touched with purplish grey on the sides. The subgenital plate (Pl. XVII, Fig. 10) unlike *forcepeta*, is distinctly visible, being broad, with a narrow deep "cleft" extending two-thirds of its length; the distal margin wide and slightly concave, while the lateral margin beyond the attachment bevelled. The subgenital plate pilose except for a pair of small triangular lateral pieces distally. The interior genital plate obscured by subgenital plate; the puncture is defined by a rather wide chitinized ring. Gonapophyses bent strongly mesally, narrow proximally and distally. Sense tubercles of paraprocts purple, small. Suranal plate purplish, short, gently rounded distally.

Male:

Length of body 1.5 mm. ave. of 7 individuals.

Length of fore wings 1.8 mm. ave. of 7 individuals.

Length of antennæ 1.25 mm. ave. of 7 individuals.

Resembles the female closely; eyes and antennæ not appreciably larger, abdomen slightly less robust. In this species the claspers (Pl. XVIII, Fig. 4) curve first mesally but bend out again to point laterally. Their direction is directly opposed to the mesal direction of the claspers in *forcepeta* which point serves as a ready means of distinguishing between

the two species. The basal three-fifths of the claspers considerably broader than the distal two-fifths; terminally, the piece has a foot-like enlargement. The hypandrium a rather short plate with a convex distal margin; lying directly ahead a pair of small, short, nearly triangular plates which end in a rounded lobe-like part; the interval between these plates rather narrow, deep and angular at the base. The parameres fused to form a notched rod. Paraprocts give rise to slender curved mesally directed plates.

New York: Ithaca: Aug. 22, 1926, 23 ♀, 7 ♂, 2 nymphs, on red cedar; Aug. 8, 1925, 9 ♀, 8 ♂, in dry leaves; July 11, 1926, 1 ♀ in dead leaves on fallen tree, Holotype (♂) Allotype and Paratypes; Enfield Glen, Tompkins County, Aug. 23, 1925, 2 ♀, 2 ♂; Danby, Oct. 19, 1924, 1 ♂; Montour Falls, Sept. 21, 1924, 1 ♀.

Maine: Sebasticook Lake, Aug. 24, 1925, 1 ♀ (C. R. C.); Wintersport, Aug. 29, 1925, 1 ♀, 1 ♂ (C. R. C.).

Virginia: Blacksburg, Oct. 4, 1926, 1 ♂ (C. & B.); Spottswood, Oct. 4, 1926, 7 ♀, 4 ♂ (C. & B.).

North Carolina: Lake Waccamaw, Oct. 21, 1926, 6 ♀, 1 ♂ (C. & B.); Davis Gap, Waynesville, Oct. 14, 1926, 1 ♀ (C. & B.).

Wyoming: East Entrance to Yellowstone Park, Aug. 31, 1927, 2 ♀, 1 ♂ (C. R. C.).

This small species is sometimes found in very large numbers in dead leaves of deciduous trees and on at least one conifer, the cedar. The names assigned to this and its near relative *L. forcepeta* were suggested from the shape of the claspers in the male.

#### *Lachesilla forcepeta* new species

Female:

Length of body 1.6 mm. ave. of 6 individuals.

Length of fore wings 1.6 mm. ave. of 6 individuals.

Length of antennæ 1.1 mm. ave. of 6 individuals.

Very similar to *contraforcepeta* in size, color and general appearance, the genitalial characters serving to distinguished the species. Subgenital plate (Pl. XVII, Fig. 2) indistinct in unstained material, but lying below it distally, an elliptical yellowish portion of the inner genital plate distinctly visible, even in teneral forms. Upon staining, the subgenital plate is found to be rather indistinct in outline but generally quadrate, the distal margin wide and convex; entire plate pilose except for the distal marginal strip and this narrows mesally. The pair of gonapophyses curved, blunt-pointed, the proximal portion narrows at point of attachment.

Male:

Length of body 1.4 mm. ave. of 6 individuals.



Length of fore wings 1.65 mm. ave. of 6 individuals.

Length of antennæ 1.4 mm. ave. of 6 individuals.

The pair of conspicuous claspers (Pl. XVIII, Fig. 1) are awl-shaped; the basal half is wide and stout and then tapers down with a slight mesal twist, straightens out and finally terminates pointing in a definite mesal direction. Lying between the claspers at their base, the hypandrium, a wide, rather short plate with a slightly concave distal margin; midway on this distal margin a pair of small, lobe-like, weakly chitinized plates. The parameres are fused to form a slender rod which ends at the distal margin of the hypandrium. The sense tubercles of paraprocts of moderate size, rather flat.

New York: Ithaca, Sept. 12, 1926, 1 ♀, Aug. 1, 1926, 1 ♀; Geneseo, Sept. 20, 1925, 1 ♀; Rockland Co., Sept. 10, 1925, 1 ♀, 1 nymph on juniper; Artists Lake, Suffolk Co., Sept. 19, 1926, 1 ♂ (Paratypes); Sea Cliff, L. I., Sept. 6, 1925, 11 ♀, 2 ♂, on dead oak leaves. Holotype (♂) Allotype and Paratypes.

Kentucky: Brooklyn Bridge, June 29, 1925, 1 ♂, beating bushes; Valley View, June 28, 1925, 1 ♀, 2 ♂, beating bushes.

North Carolina: Base of Mt. Pisgah, Buncombe Co., Oct. 13, 1926, 2 ♀ (C. & B.).

Tennessee: Mill Creek, below falls on Mt. Leconte, Oct. 10, 1926, 1 ♀ (C. & B.).

Georgia: Tiger, Oct. 18, 1926, 1 ♀, 1 ♂ (C. & B.).

Florida: The Glen, Marion Co., Mar. 6, 1927, 6 ♀, 4 ♂ (M. D. Leonard).

***Lachesilla forcepeta* var. *major* new variety**

Female:

Length of body 1.7 mm. ave. of 4 individuals.

Length of fore wings 2.0 mm. ave. of 4 individuals.

Length of antennæ 1.6 mm. ave. of 2 individuals.

Differs from *forcepeta* as follows: is larger; definite rings of grey occur on the abdomen; the wings are nearly hyaline, the veins distinct, stout. No significant point of difference was found in the genitalia.

Male:

Length of body 1.5 mm. ave. of 4 individuals.

Length of fore wings 1.8 mm. ave. of 4 individuals.

Length of antennæ 1.5 mm. ave. of 3 individuals.

The claspers (Pl. XVIII, Fig. 6) while closely resembling those in *forcepeta* differ in that the basal portion is narrower, the distal portion is longer and definitely more twisted.

Tennessee: Mill Creek, below falls on Mt. Leconte, Oct. 10, 1926, 2 ♀, 1 ♂ (C. & B.).

Virginia: Spottswood, Oct. 4, 1926, 1 ♂ (C. & B.).

North Carolina: Summit of Big Bald, Pisgah Range, Oct. 13, 1926, 1 ♀ (C. & B.); Cowee Mts., Swain Co., Oct. 15, 1926, 1 ♀ (C. & B.).

Indiana: Tremont, Sand Dunes, July 24, 1926, 2 ♂, 1 nymph, in dry oak leaves.

Florida: The Glen, Marion Co., March 6, 1927, 11 ♀ (M. D. Leonard).

***Lachesilla corona* new species**

Female:

Length of body 1.85 mm. ave. of 6 individuals.

Length of fore wings 2.0 mm. ave. of 6 individuals.

Length of antennæ 1.5 mm. ave. of 6 individuals.

Head and thorax tan, abdomen dull white ringed or not with grey. Head and appendages uniformly tan with the dotted areas of the vertex indistinct, deeper tan. Eyes dull, bluish black.

Thorax: Uniformly tan throughout, including the legs; somewhat darker on tergum with some paling on the pleuræ. Wings unmarked, the fore wings with a faint orange cast. Veins distinct, tan.

Abdomen whitish, coarsely striped or not with grey. In teneral specimens a broken dark line extends along the sides of the abdomen, thorax, and ending at the genæ. Genitalia (Pl. XVII, Fig. 4) characterized by a broad readily visible subgenital plate bearing a diamond shaped, rather weakly chitinized distal portion which bears a long, slender, straight prong. Subgenital plate cleft apically. Interior genital plate large, diamond shaped, almost completely obscured by the subgenital plate. Gonapophyses long, slender, curved, somewhat swollen at base; the dorsal margin forms a straight line when viewed from the side. Sense tubercles of paraprocts of usual size, brown and purplish. Suranal plate elongate, evenly rounded distally, the distal three-fifths more highly chitinized than basal portion.

Male:

Length of body 1.7 mm. ave. of 6 individuals.

Length of fore wings 2.1 mm. ave. of 6 individuals.

Length of antennæ 1.6 mm. ave. of 6 individuals.

Marked as female, and of much the same general appearance; eyes slightly larger and antennæ somewhat more robust. Genitalia (Pl. XVIII, Fig. 11) symmetrical, hypandrium a large plate which is divided into a pair of lateral pieces by a wide deep notch. These are united at the base where a wide narrow plate is also fused. The fused parameres are Y-shaped and strongly chitinized, each arm in turn giving rise to a long, less strongly chitinized prong. Laterally from a distal point on each element of the

hypandrium arise two pairs of long slender arms. The inner pair closely resembles the pair in *rufa*, bending strongly mesally and then twisting out laterally again. The outer pair are twisted a little at the base but are nearly straight throughout most of their length. Below and between the sense tubercles, the paraprocts are reduced mesally to form a pair of short, flat, blunt prongs.

New York: Hudson, July 15, 1926, 3 ♀ in dry leaves on fallen tree; Ithaca, Aug. 22, 1926, 2 ♀, 1 ♂ on red cedar Holotype, (♂) Allotype Paratype, June 11, 1907, 2 ♀, 3 ♂ "from round golden-rod-gall Cage"; Enfield Center, Sept. 27, 1927, 1 ♂ (Chester Rea) on wood pile (mostly willow); Penn Yan, Sept. 29, 1926, 2 ♀, 1 ♂; Wellsville, Sept. 15, 1925, 1 ♀; Sea Cliff, L. I., Sept. 6, 1925, 1 ♀ in dead oak leaves.

Virginia: Spottswood, Oct. 4, 1926, 1 ♂ (C. & B.).

This species is readily distinguished from the others by the maze of antler-like prongs in the genitalia of the male.

#### *Lachesilla nubilis* (Aaron)

*Cacilius nubilis* Aaron. Acad. Nat. Sci. Phila. Proc. 38: 13.

Pl. 1, Fig. 3.

Female:

Length of body 1.6 mm. ave. of 7 individuals.

Length of fore wings 2.1 mm. ave. of 7 individuals.

Length of antennæ 1.4 mm. ave. of 4 individuals.

Head: The dotted areas of vertex tan or brown according to the individual; the lateral ocelli margined mesally with a brownish black crescent, the median ocellus with a similarly located spot; clypeus appearing entirely tan, but actually lineated with wide mesally directed tan lines with an uncolored crescent on the anterior margin; genæ tan paling anteriorly, labrum with some brown. Maxillary palpus brown, the first segment pale. Antennal segments 1 and 2 and proximal half of 3 pale, then the segments becoming tan deepening to brown distally. Eyes dull black.

Thorax: Tergal lobes golden brown, pale tan in the sutures; pleurae light brown with considerable fading to white. Legs tan, tarsi light brown. Wings hyaline, (Pl. XXI, Fig. 18) fore wings marked with brown as follows: elongate spots at end of

veins  $R_1$  to  $Cu_2$ , inclusive, which narrow to points at the wing margin; the distal half of the wing more or less clouded with pale brown (not visible in some specimens) with hyaline crescents or triangles at the wing margin between veins. Pterostigma opaque of the usual shape. Veins brown, distinct. Hind wings hyaline with small brown spots at end of veins.

Abdomen: Often strongly striped and generally overcast with dark purplish grey. Genitalia (Pl. XVII, Fig. 1) moderately distinct, characterized by the absence of the arm-like pair of gonapophyses. Subgenital plate broad, definitely chitinized laterally especially surrounding point of attachment. Margin beyond attachment forming a flattened letter M. Fused to the subgenital plate below, midway, a plate with a convex basal margin and with a slight cleft midway; it is composed of a pair of roughly triangular side pieces. The interior genital plate projects beyond the subgenital plate, the chitinized portion forming the letter W, the lateral parts wide, blunt pointed, the middle portion with strong laterally directed prongs which extend behind the lateral pieces; the puncture is visible just below the W-shaped part; interior genital plate broadly attached to what is probably the eighth tergite. Sense tubercle of paraprocts rather large, brown.

Male:

Length of body 1.4 mm. ave. of 4 individuals.

Length of fore wings 2.2 mm. ave. of 4 individuals.

Length of antennæ 1.5 mm. measurement of 1 individual.

Generally identical with female in markings; eyes twice as large; markings on wings probably not as distinct or extensive. Genitalia and terminal abdominal segments (Pl. XVIII, Fig. 5) symmetrical, occupying nearly a third of the abdomen. Strongly chitinized, pincer-like projections extend mesally from the eighth segment and from the longer basal prongs arise a pair of long sword-shaped laterally directed claspers which are drawn out to a fine point distally and are slender proximally. Between the pincer-shaped pieces a small plate (hypandrium?) with slightly convex margins on all sides, the distal margin only half as wide as the basal one. The parameres consist of a long, stout rod,



furcated at the base, somewhat belled out distally, but arising directly from the belled out cavity a highly chitinized Y-shaped structure. This forms the basal support for a pair of long, narrow, twisted plates below which in turn lies a pair of curved, slender arms which are not readily visible unless viewed laterally. Covering the Y-shaped support, a small plate with a concave distal margin except for a peak midway, while the basal margin is convex and the lateral margins with a notch near base. Sense tubercles brown, of moderate size, arising between them a pair of small, blunt, highly chitinized prongs. On the suranal plate a weakly chitinized structure which when viewed in profile consists of a pair of ear-like lateral lobes separated by a straight median portion.

Texas: "Southern Texas, one specimen discovered while beating a live oak thicket" (Aaron) P. A. N. S. Holotype.

Oklahoma: Comanche Co. 6 ♀ 4 ♂ (T. H. Hubbell).

Tennessee: Bristol, Oct. 5, 1926, 1 ♀ (C. & B.) taken at light of Coca-cola stand; Summit of Mt. Leconte, Oct. 10, 1926, 1 ♀ 1 ♂ (C. & B.).

North Carolina: Frying Pan Gap, Mt. Pisgah, Oct. 13, 1926, 1 ♀ (C. & B.).

Florida: Orlando, Jan., 2 ♂ (O. C. McBride).

An examination of the types of *Cacilius nubilis* Aaron showed the absence of hairs on the wing which places the species in *Lachesilla*. *L. nubilis* and *punctata* appear to be closely related as indicated by the genitalia and wing markings.

#### *Lachesilla pacifica* new species

Female:

Length of body 1.5 mm. ave. of 4 individuals.

Length of fore wings 1.7 mm. ave. of 4 individuals.

White, marked with brown and purplish grey.

Head: The dotted areas on vertex distinct; clypeus lineated with faint brown with an unmarked crescent on the anterior margin; genæ and labrum white with a faint brown streak on genæ. Maxillary palpus brown. Eyes dull black.

Thorax brown above on tergal lobes, paling at sutures; coxæ and dorsal half of pleuræ brown, ventral half pale. Legs pale, tarsi somewhat darker. Wings unmarked, subhyaline. Veins brown, distinct. Pterostigma opaque, of moderate depth.

Abdomen with a purplish grey cast on the sides; sometimes assuming form of stripes. Subgenital plate (Pl. XVII, Fig. 5) readily visible, five-sided with a blunt, slightly concave apex. Lying below the subgenital plate at its apex a rather strongly chitinized small plate with a triangular cleft at its base. Gonapophyses blunt-pointed, broadly attached; somewhat constricted just beyond attachment; the piece is bent to face mesally. Sense tubercles of paraprocts small, purplish. Suranal plate roughly heart-shaped.

Washington: Seattle, Aug. 7, 1927, 5 ♀ (C. R. C.) Holotype and Paratypes.

### *Lachesilla pedicularia* Linne

A nearly complete synonymy of this species appears in Enderlein, G. Catt. Coll. Selys Longchamps Fasc. 3 Part 3: 16-19. 1915.

Female (*macropterous*):

Length of body 1.55 mm. ave. of 10 individuals.

Length of fore wings 1.7 mm. ave. of 10 individuals.

Length of antennæ 1.3 mm. ave. of 10 individuals.

This cosmopolitan species shows considerable variation in size, intensity and extent of coloration.

Typically the head, thorax, their appendages and the terminal abdominal segments and genitalia golden brown, abdomen dull white, ringed with distinct greyish brown stripes which are usually confined to the tergites.

Head: Uniformly shining golden brown ranging to a very deep brown; paling at genae and labrum. Eyes small, dull black.

Thorax: Uniformly golden brown ranging to dark brown, with some paling on pleuræ. Legs light brown throughout. Wings (Pl. XXI, Fig. 17) hyaline, iridescent. Pterostigma opaque, of usual shape. Veins distinct, brown.

Abdomen dull white, usually distinctly striped with greyish brown. In some individuals the stripes narrow, or almost lacking, while on the other extreme they may be broad, almost touching each other, and dark purplish brown in color; a rather characteristic indication of a mid-dorsal line. Genitalia (Pl. XVII, Fig. 11) relatively strongly chitinized, making the parts readily visible. The subgenital plate wide, with a median notch

basally; the distal margin convex, even slightly blunt-pointed. The puncture on the interior genital plate is made visible by a wide border of chitinization. Gonapophyses of moderate proportions, blunt pointed, directed mostly mesally; rather wide for a short distance proximally. Sense tubercles of paraprocts brown, inconspicuous. Suranal plate short, wide, blunt pointed.

Female (*brachypterous*):

Length of body 1.7 mm. ave. of 10 individuals.

Length of fore wings .9 mm. ave. of 10 individuals.

Length of antennæ 1.25 mm. ave. of 10 individuals.

Short-winged females (Pl. XXI, Fig. 10) are commonly found where the species breeds. Wings reduced in all directions; veins distinct in both pairs of wings and retaining all the venational characters of the genus. *Brachypterous* females are probably not capable of flight; in my collections they have been taken exclusively where the species breeds. The abdomen is probably more plump on the average than *macropterous* females.

Male:

Length of body 1.35 mm. ave. of 10 individuals.

Length of fore wings 1.65 mm. ave. of 10 individuals.

Length of antennæ 1.55 mm. ave. of 10 individuals.

(Individuals with wings only 1.1 mm. long have been found but 1.65 mm. is a fair average length for normal males.)

Resembles female, less robust; antennæ more robust, eyes small, of same size as female. The genitalia distinct, brown, concolorous with head and thorax. Markings on abdomen probably not as extensive or intensive as female.

Genitalia (Pl. XVIII, Fig. 2) symmetrical consisting of a wide short plate composed of two parts: a basal portion or hypandrium triangular in outline, the base of the triangle being the wide nearly straight basal margin of the compound piece—a slight ridge occurs midway; the distal part consists of a pair of claspers, the basal portions of which are nearly fused to the hypandrium. Running diagonally at this point a pair of highly chitinized strips which distally nearly meet and there twist laterally giving rise to sharp, caudally pointing prongs. The fused parameres Y-shaped. Basal portion stout extending be-

hind the hypandrium; the branches long, very slender and drawn out to fine points. The sense tubercles rather larger than usual, paraprocts giving rise to small, ventro-mesally directed plates. Distally on suranal plate arises a small ventrally pointing hook while just cephalic of its base a small puncture.

New York: Ithaca, Oct. 3, 1925, 1 ♀ (T. C. Barnes) sweeping grass, Sept. 10, 1925, 2 ♀ 2 ♂ (P. P. Babiý), Aug. 13, 1926, 1 ♀ (P. P. Babiý), Sept. 5, 1926, 1 ♂ (P. P. Babiý) Aug. 30, 1924, 1 ♂ indoors, Sept. 23, 1926, 1 ♂ (K. C. Sullivan) floating dead in Beebe Lake; Hadley, Aug. 15, 1925, 1 ♂ (T. C. Barnes) in box containing white pine shoots; Enfield Center, Sept. 27, 1927, 35 ♀ (10 *brachypterous*) 22 ♂ (Chester Rea) breeding under loose bark on wood (mostly willow) in woodpile; McLean Reservation, Argus Brook, Sept. 16, 1924, 1 ♂ (Sibley); Moravia, Sept. 3, 1922, 1 ♀ 7 ♂ (T. Helen MacLean); Rock City, Sept. 16, 1925, 1 ♂ in dead leaves; Montour Falls, Sept. 21, 1924, 1 ♂; Richburg, Sept. 16, 1925, 1 ♀ 2 ♂ in dead leaves; West Barre, Sept. 19, 1925, 3 ♀ in dead leaves; Stow, Sept. 17, 1925, 1 ♂ in a dead leaf; Painted Post, Sept. 15, 1925, 1 ♂ in a dead leaf; Penn Yan, July 5, 1926, 1 ♂ (C. R. C.); Upper Red Hook, Aug. 28, 1925, 1 ♀ 1 ♂ on barn wall; Nigger Pond, Oswego Co., Sept. 3, 1926, 1 ♂; Lake George, Sept. 15, 1925, 1 ♂ (M. D. Leonard); Whetstone Gulf, Lewis Co., Sept. 2, 1926, 1 ♂ in dead leaves; Medina, Sept. 16, 1927, 4 ♀ 1 ♂ (M. D. Leonard) occurring in large numbers on corn.

Maine: Seabasticook Lake, Aug. 26, 1925, 20 ♀ 1 ♂ (C. R. C.) in damp hay.

Vermont: Woodstock, Sept. 1925, 5 ♂ (A. M. Nadler) in barn.

Pennsylvania: Arendtsville, Aug. 23, 1922, 1 ♂ (S. W. Frost) taken from the stomach of the frog *Hyla pickeringii* Holbrook.

Kentucky: Quicksand, June 25, 1925, 24 ♀ (12 *brachypterous*) 29 ♂ and 11 nymphs. Breeding in large numbers in moist straw and débris in old houses; Quicksand, June 25, 1925, 31 ♀ 18 ♂ large numbers stuck in paint on house.

North Carolina: Jacksonville, Oct. 23, 1926, 1 ♀ (C. & B.); Mt. Pisgah, Oct. 14, 1926, 1 ♀ (C. & B.).

Utah: Logan, July 3, 1926, 1 ♀ (J. G. Needham).



Washington: Longmire, Aug. 22, 1927, 1 ♂ (C. R. C.).

Among the winged members of the Corrodentia, *L. pedicularia* is probably the most numerically common and widespread. It is found in most of the inhabited portions of the world. It breeds indoors and out, occurring in a great variety of situations. At times great swarms appear which rival the flights of migrating aphids. I have seen newly painted houses entrap thousands of this psocid. *L. pedicularia* not infrequently appears in Economic literature. It is occasionally an important household pest, breeding in furniture and mattresses stuffed with plant parts and where it usually is associated with *Trogium pulsatorium* L. and *Liposcelis divinatorius* Müll.

The rather unusual variation in size markings and presence of specialized forms has led to the creation of many synonyms.

#### *Lachesilla punctata* (Banks)

*Elipsocus punctatus* Banks. Am. Ent. Soc. Trans. 32: 1. 1905.

Female:

Length of body 2.2 mm.

Length of fore wings 2.4 mm.

Length of antennæ 1.6 mm.

Head: Dotted areas of vertex brown; clypeus dull orange, lineated with darker orange the lines directed mesally; labrum brown; genæ whitish with a small white spot below the eye. Eyes a phosphorescent greenish blue. Antennæ brown, dark distally, pale proximally. Maxillary palpus brown, each segment becoming progressively darker distally.

Thorax: Generally brown with several whitish areas on dorsum. Legs pale, tarsi and distal portion of tibiae brown. Wings hyaline, with brown spots at the end of veins  $R_{2+3}$  to  $M_3$  inclusive. The spots are roughly heart-shaped. Veins dark brown margined with brown distally, pale proximally. Hind wing hyaline, with a faint brown spot at end of viens.

Abdomen dull whitish, broad and coarsely ringed with brownish grey. Terminal abdominal segments and genitalia (Pl. XVII, Fig. 12) distinctly chitinized. Subgenital plate large, somewhat hexagonal in form and distally superimposes a plate

the basal margin of which is strongly chitinized. These two plates fuse distally to form long lateral lobes between which lies a membranous quadrate piece. Lying just below these terminal pieces the distally chitinized roughly hexagonal interior genital plate with the basal side deeply cleft and the four distal angles produced into sharp prongs; the puncture lies in the distal two-fifths. Gonapophyses degenerated into insignificant, slender arms, the oval distal portion only being distinctly visible. Sense tubercles on paraprocts dark purple. Suranal plate elongate, lobe-like.

Male:

Length of wings 3.0 mm.

Similar in markings to female.

Genitalia (Pl. XVIII, Fig. 8) symmetrical. Arising at termination of narrow pincher-shaped projections, a pair of extremely long and slender sickle-shaped claspers. The ninth segment completely bridged ventrally by an elaborated U-shaped part. The fused parameres consist of a long slender rod which forks distally, each fork terminating in a foot-like enlargement. The distal two-fifths of parameres covered by a small heart-shaped hypandrium. Sense tubercles of paraprocts small, bearing mesally a short, straight, upward pointed prong. Suranal plate produced into a single very large beak-shaped piece, broad at base and apex pointed ventrally.

California: San Mateo Co. 7 specimens (Baker) Holotype (♂) Allotype, Paratypes. M. C. Z.

Arizona: Prescott, Aug. 23, 1927, 1 ♀ at light (J. D. Hood).

This species was originally placed in *Elipsocus* by Banks but an examination of type material revealed that it should be assigned to *Lachesilla*. The female used here may not be *punctata*. It was only possible to examine critically the one female from Prescott, Arizona, which superficially was similar to the male paratype studied but the wing measures .5 mm. shorter.

#### *Lachesilla rufa* (Walsh)

*P(socus) rufus* Walsh. Ent. Soc. Phila. Proc. **2**: 185. 1863.

*Cæcilius rufus* Hagen. Verh. zool.-bot. Ges. Wein. **16**: 206. 1866.

*Pterodela rufa* Enderlein. Stett. Ent. Zeit. **67**: 319. 1906.

*Cæcilius impactus* Aaron. Acad. Nat. Sci. Phila. Proc. **38**: 14.  
1886.

Female:

Length of body 2.3 mm. ave. of 7 individuals.

Length of fore wings 2.7 mm. ave. of 7 individuals.

Length of antennæ 2.0 mm. ave. of 7 individuals.

Head: Dotted areas of vertex tan, moderately distinct; clypeus dull orange due to the indistinct lineation of broad, broken, mesally directed lines; labrum pale orange; genæ white obscurely touched with tan. Maxillary palpus light brown, last segment darkest. Antennæ pale in proximal segments darkening to brown distally. Eyes dull bluish black.

Thorax: Tan with considerable fading to pale orange or white both on the tergal lobes and on the pleuræ. Legs pale, tarsi light brown. Wings (Pl. XXI, Fig. 16) unmarked, hyaline with possibly a faint orange tint. Veins slender, pale brown; M, Rs and branches darker. In some specimens Rs joined to M at point. Veins in hind wings pale.

Abdomen: White, coarsely ringed with grey, venter pale. In the genitalia (Pl. XVII, Fig. 9) the interior genital plate hexagonal in outline and strongly chitinized, being readily visible even in teneral forms. The subgenital plate rather weakly chitinized except laterally. Midway distally is borne a small forked plate of which the forked portion occupies the distal half of the process. (This plate not readily seen in unstained material.) The gonapophyses large, straight, rather broadly attached, tapering down gradually to the apex. The puncture on the interior genital plate lies about midway and it is framed by a chitinized yoke. Sense tubercles of paraprocts rather small, dark purple. Suranal plate elongate, evenly rounded distally.

Male:

Length of body 1.9 mm. ave. of 7 individuals.

Length of fore wings 2.75 mm. ave. of 7 individuals.

Length of antennæ 2.45 mm. ave. of 7 individuals.

Closely resembles female in markings. The antennæ more robust, but the eyes are not appreciably larger. Abdomen shorter and much less robust than female, truncate distally.

Genitalia (Pl. XVIII, Fig. 3) symmetrical. The hypandrium very large, slightly more highly chitinized in the basal three-fifths, the distal margin concave with a narrow, strongly chitinized margin. At the base of the hypandrium a small narrow plate. A pair of conspicuous curved claspers arise laterally of the hypandrium, lying along its lateral margin curving strongly mesally and then dorsally and laterally. The parameres fused, Y-shaped, consisting of a short base and extremely long and slender arms. Sense tubercles of paraprocts of usual size while below and between these a pair of short, straight, dorsally directed prongs.

New York: Ithaca, Sept. 12, 1925, 1 ♀ 1 ♂ in dead oak and poplar leaves; Penn Yan, Sept. 29, 1926, 4 ♀, Aug. 2, 1925, 1 ♀; Richburg, Sept. 16, 1926, 12 ♀ 1 ♂ in dry leaves; Rock City, Sept., 1925, 6 ♀ in dead leaves; West Barre, Sept. 19, 1925, 2 ♂ in dead leaves; Barcelona, Sept. 19, 1925, 11 ♀ 3 ♂ in dead leaves; Silver Creek, Sept. 18, 1926, 6 ♀ 5 ♂ in dead leaves; Geneseo, Sept. 20, 1925, 8 ♀ in dead leaves and on dead cedar branches; Elmira, Oct. 1, 1925, 8 ♀ 8 ♂ in dead oak and chestnut leaves; Stow, Sept. 17, 1925, 7 ♀ 5 ♂ in dead leaves; Rochester, Oct. 8, 1927, 6 ♀ 2 ♂ (J. D. Hood) beating miscellaneous trees.

Indiana: Tremont, July 24, 1926, 1 ♀ in dry oak leaves. Sand Dunes.

Virginia: Blacksburg, Oct. 4, 1926, 3 ♀ 1 ♂ (C. & B.).

North Carolina: Andrews, Oct. 17, 1926, 1 ♂ (C. & B.); Summit of Big Bald, Pisgah Range, Oct. 13, 1926, 1 ♂ (C. & B.); Mt. Pisgah, Oct. 14, 1926, 1 ♀ (C. & B.); Wayah Bald, Macon Co., Oct. 16, 1926, 1 ♂ (C. & B.); Base of Mt. Pisgah, Buncombe Co., Oct. 13, 1926, 2 ♀ (C. & B.).

Tennessee: Mill Creek, below falls on Mt. Leconte, Oct. 10, 1926, 2 ♂ (C. & B.); Laurel Creek, Sevier Co., Oct. 8, 1926, 21 ♀ 2 ♂ (C. & B.); Bristol, Oct. 5, 1926, 1 ♂ (C. & B.) taken at light of Coca-cola stand; Summit of Mt. Leconte, Oct. 10, 1926, 2 ♀ (C. & B.).



Georgia: Tiger, Oct. 18, 1926, 1 ♀ (C. & B.); Top of Blue Ridge at Towns and Rabun Co. line, Oct. 18, 1926, 1 ♀ (C. & B.).

Pennsylvania: Philadelphia, 1 ♂ (Aaron) Holotype of *Cæcilius impactus*. P. A. N. S.

The type of *rufa* is non-existent. In Walsh's description he indicates that the species measures 3.25 mm. "length to tip of wings." This relatively large size, together with Walsh's short description is sufficient to identify the species. *L. rufa* is exceedingly common in the dead or dying leaves of deciduous trees. Aaron's *Cæcilius impactus* is a male of *L. rufa*.

#### *Lachesilla silvicola* new species

Female:

Length of body 1.8 mm. ave. of 7 individuals.

Length of fore wings 2.15 mm. ave. of 7 individuals.

Length of antennæ 1.4 mm. ave. of 5 individuals.

Head: Dotted areas of vertex light brown; a small brownish area on front touching the median ocellus; a brown ring around antennal socket, extending from which a short brown line touching eye midway and a longer parallel line below eye; clypeus with a large triangular white area posteriorly and a crescent-shaped paling along anterior margin. The remaining lateral areas lined with broad tan; genæ, except for line below eye, dull white; labrum unmarked. Maxillary palpus pale, last segment light brown. Eyes dull bluish black. Antennæ pale at base, light brown distally.

Thorax: Mostly dull white above, tergal lobes white margined with pale brown; pleuræ brown at, and bordering sutures, a longitudinal broken brown line midway (especially noticeable on teneral forms). Legs pale, tarsi golden brown. Wings (Pl. XXI, Fig. 9) unmarked, hyaline. Pterostigma opaque, of usual shape. Veins pale throughout, becoming light brown distally. M and Cu typically united at a point.

Abdomen: Dull white above with stripes of greyish brown on the sides, fading caudally. (The abdomen of specimens at hand covered with white patches. The specimens were collected into 95% alcohol, which may be responsible for the condition.) Genitalia (Pl. XVII, Fig. 3) not readily visible in unstained material. On the subgenital plate, arising midway, a small forked plate similar to the structure in *arida* and *rufa*—short and wide as in *arida*. Upon staining, the subgenital plate is found to be rather indefinite in outline, the distal margin wide and convex; cephalic to the forked plate, the subgenital plate pilose, while the large distal elliptical area non-pilose. Interior genital plate diamond-shaped with a highly chitinized turned under flap basally and an infuscated area apically and around the puncture. Gonapophyses short, blunt-pointed, and with a swollen basal portion at attachment to plate. This plate is fused with the distal

portion of the interior genital plate and extends considerably caudo-laterally of the gonapophyses. Sense tubercles of paraprocts small, brown.

Male:

Length of body 1.5 mm.

Length of fore wings 2.4 mm.

Markings as in female; more slender throughout; eyes not appreciably larger. Genitalia (Pl. XVIII, Fig. 12) asymmetrical. Hypandrium a large roughly rectangular plate which has a deep crescent-shaped, less highly chitinized part distally. Fused to this plate midway—and outside—a pair of lateral strips and a long median strip giving rise to a large clasper with a spear-shaped apical portion. (In the single specimen available the point turns to the left.) The parameres lying just below the spear-shaped apex independent, each element being stout, blunt-pointed, upward directed prongs. Laterally beyond the median plate a pair of small lobe-like plates (the claspers of other members of the genus?) with a sense field proximally. Dorsally a pair of asymmetrical twisted prongs which arise mesally from small swollen areas; dorsally of these the suranal plate, a small, highly chitinized, convex, elongate plate, rounded distally and constricted proximally.

Washington: Seattle, Aug. 7, 1927, 4 ♀ 1 ♂ (C. R. C.) Holotype (♂); Allotype, Paratypes. Longmire, Aug. 22, 1927, 63 ♀ (C. R. C). Paratypes; Edmonds, Aug. 16, 1927, 13 ♀ (C. R. C.). Paratypes.

#### Subfamily Bertkauinae

##### *Bertkauia* Kolbe 1882

Type: *B. lucifuga* Rambur 1882.

Female apterous (male unknown to me). Segments of thorax nearly uniform in size. Legs unarmed by ctenidia, tarsi two segmented, segments long. Head elongate, narrow, (especially between the eyes) clypeus convex but relatively flat. Ocelli absent. Antennae thirteen-jointed. Buccal rods stout, very prominent; distally they are flattened and so twisted that the flattened surface faces dorso-mesally; the distal margin is strongly chitinized and produced into eight or more short teeth which from their disposition would suggest a saw-like function. Abdomen very large. In genital processes (Pl. XIX, Fig. 9) an indication of three pairs of gonapophyses. Lateral surface of paraprocts flat, triangular and without sense tubercles.

**Bertkaulia lepidinaria** new species

## Female:

Length of body 3.0 mm. ave. of 10 individuals.

Length of antennæ 3.0 mm. ave. of 10 individuals.

Head: Vertex orange suffused with brown which deepens anteriorly, a large median U-shaped mark of pure orange; remainder of head dark brown with the genæ palest except for a dark spot anteriorly. An elongate fuscous spot ahead of eye, which extends slightly beyond the base of antennæ (not distinguishable in deeply colored specimens). A deep pit below antennæ. Antennæ dark brown, sparsely clothed with long hair, the first segment distally with a shield-shaped membranous area. Maxillary palpus long, slender, dark brown throughout. Eyes small, dull bluish black.

Thorax dull white above; medianly on tergum of prothorax a pair of conspicuous hairs while the tergum of meso- and metathorax sparsely pilose. Pleuræ dark brown and likewise the legs; tarsal claws long, slender, with a long inner proximal spine.

Abdomen dull yellowish white marked with brown suffused with grey. The pigment is typically distributed as follows: venter pale; on the sides a large, irregular spot or stripe which is distinct cephalically and narrows or fades out caudally; stripes extending dorsally from this spot at the sutures (they usually fade out well before the dorso-median line); above medianly, elongate, diamond-shaped marks centering on the suture between segments 1 and 2, 2 and 3, while on segments 5 and 6 two long, broad bands which narrow down to a triangular mark on 7 and a line on 8. Abdomen strongly pilose, the hairs roughly arranged in two rows to a segment; hairs on dorsum several times longer than those on venter.

Genital processes (Pl. XIX, Fig. 8) brown. The subgenital plate V-shaped with a blunt pointed apex. Gonapophyses consisting of two distinct pairs (Pl. XIX, Fig. 9). The ventral gonapophyses long, slender blades which gradually widen distally and are then suddenly produced into a sharp drawn out point. The other pair of gonapophyses consist of two parts, the proximal portion probably representing the lateral gonapophyses and the distal piece the dorsal gonapophyses. The basal portion is broad, elongate, convex and bears a staggered row of from 5 to 7 (possibly more or less) spines along the lateral margin; the distal part is twisted mesally at right angles (attached to the basal part by a slender neck) and consists of a broad, hook-like basal portion and an extremely long and finely drawn out distal portion. Paraprocts triangular, pilose on distal half and especially along this margin. Suranal plate dull orange, nearly semicircular in form, pilose.

New York: Ithaca, 1926 collections: Aug. 6, 15 ♀, Aug. 15, 7 ♀, Aug. 22, 11 ♀, Sept. 26, 7 ♀ 3 nymphs. On large stones in shade. Holotype and Paratypes. Penn Yan, Aug. 29, 1926, 34 ♀ 3 nymphs on large stones in shade; Michigan Mills, Lewis

Co., Sept. 1, 1926, 24 ♀ on stones in stone wall; Hunter, Aug. 16, 1925, 11 ♀ 1 nymph on stones; Penn Yan, Aug. 2, 1925, 11 ♀ 5 nymphs on large stones.

Kentucky: Lexington, July 5, 1925, 2 ♀ (L. Giovannoli).

***Bertkausia crosbyana* new species**

Female:

Length of body 2.3 mm. ave. of 10 individuals.

Length of antennæ 2.15 mm. ave. of 10 individuals.

Similar to *lepicedinaria*, differing from it principally in size, markings (mostly abdominal) and habitat. This species averages fully .5 mm. shorter. It is almost invariably found in leaf mold while its relative appears to be confined almost exclusively to stones. The genitalia are so similar as to appear identical.

In most specimens of *Bertkausia crosbyana* there is a distinct contrast between the almost uniform creamy white or violet of the abdomen and the dark brown of head, thorax, genitalia, and the appendages. Neither the broad brown bands on the fifth and sixth tergites nor the clear-cut markings on segments 1-3, appearing in *lepicedinaria*, are found on *crosbyana*. In darker individuals a greyish violet spot lies anteriorly on the sides of the abdomen; these spots may widen, fuse and continue across the dorsum at segments 1-3. In still other individuals all the tergites are uniformly greyish violet. No dark spots by the antennæ and on genæ appear in *crosbyana*; the head is frequently almost uniform brown with little or no trace of orange on the vertex.

New York: Ithaca Aug. 1, 1926, 2 ♀ 1 nymph, Sept. 26, 1926, 1 ♀, July 12, 1925, 34 ♀ 8 nymphs in leaf mold, Aug. 1, 1926, 2 ♀ 1 nymph. Holotype Paratypes. McLean, July 31, 1926, 2 ♀ 1 nymph under stones; Penn Yan, Aug. 29, 1926, 1 ♀; Michigan Mills, Lewis Co., Sept. 1, 1926, 6 ♀; Wading River, L. I., Sept. 19, 1926, 10 ♀ 11 nymphs (A. M. Boyce) sifting leaves; Baiting Hollow, Suffolk Co., Sept. 19, 1926, 1 ♀ (A. M. Boyce); Hunter, Aug. 16, 1925, 5 ♀; Penn Yan, Aug. 2, 1925, 8 ♀ 1 nymph; Sea Cliff, L. I., Sept. 5, 1925, 18 ♀ (Augusta Wolf) sifting leaves; Ringwood, Tompkins Co., July 13, 1925, 2 nymphs, sifting leaves; Olcott, Sept. 19, 1925, 1 ♀ (C. R. C.); Wawbeek, July 26, 1925, 2 nymphs (C. R. C.) sifting leaves; Hague, Sept. 16, 1925, 1 ♀ (M. D. Leonard); Stow, Sept. 17, 1925, 8 ♀ 1 nymph (C. R. C.); Tuxedo, Oct. 7, 1925, 4 ♀ (Augusta Wolf) sifting leaves; Enfield Glen, Aug. 23, 1925, 4 ♀ (Augusta Wolf) sifting leaves; Larchmont, Sept. 25, 1925, 1 ♀



(Augusta Wolf) ; Rock City, Sept. 16, 1925, 2 ♀ (C. R. C.) sifting leaves ; Painted Post, Sept. 15, 1925, 1 ♀ (C. R. C.) sifting leaves ; Potter, July 16, 1926, 7 ♀ 1 nymph (C. R. C.) sifting leaves ; Whetstone Gulf, Lewis Co., Sept. 2, 1926, 5 ♀ (C. R. C.) ; Mt. McIntyre, Essex Co., July 24, 1925, 8 nymphs (C. R. C.) sifting leaves ; Adirondack Lodge, Essex Co., July 23, 1925, 2 ♀ 1 nymph (C. & B.).

Maine : Island Falls, Aug. 16, 1925, 1 ♀ (C. R. C.) ; Molunkus Pond, Aug. 25, 1925, 3 ♀ (C. R. C.).

New Hampshire : Littleton, Aug. 19, 1925, 1 ♀ (C. R. C.) ; Base Station, Mt. Washington, Aug. 18, 1925, 6 ♀ 1 nymph (C. R. C.).

Minnesota : Lake Minnetonka, Sept., 1925, 7 ♀ 3 nymphs (F. C. Fletcher).

Illinois : Belleville, Aug. 12, 1 ♀ (C. R. C.).

Kentucky : Quicksand, June 25, 1925, 11 ♀ 1 nymph (C. R. C.) sifting leaves.

South Carolina : Sumter, Oct. 20, 1926, 2 ♀ 6 nymphs (C. R. C.).

Florida : Dunedin, Dec. 15–Jan. 8, 1925–26, 1 ♀ (W. S. Blatchley) ; Micanopy, March 6, 1927, 1 ♀ (T. H. Hubbell).

Mississippi : Oxford, Sept., 1905, 1 ♀

#### Subfamily Peripsocinae

##### *Peripsocus* Hagen 1866

Type: *P. phæopteros* Stephens 1836.

In *Peripsocus*, Cu is unbranched and in the hind wing M is fused to Cu for a variable distance; the veins and wing margins are unhaired. The genitalia of the female resemble *Psocus*. A definite ovipositor is present consisting of a distinct egg-guide, concave dorsal gonapophyses, slender ventral gonapophyses and ear-like lateral gonapophyses. The male genitalia are symmetrical resembling in form other Cæciliidæ rather than *Psocus*. Paraprocts small, not produced into claspers. Parameres very large and highly chitinized; suspended between them a complex structure which may be a true penis.

## KEY TO PERIPSOCUS

- 1—Length of fore wings about 1.4 mm. (body 1.5 mm.)...*stagnivagus* n. sp.  
 —Length of fore wings about 2.5 mm. or more (body 2.1 mm.).....2  
 2—Vertex with a conspicuous pair of fuscous spots in addition to usual  
 dotted areas. Genæ also with fuscous spot.....*madidus*  
 —Not so marked.....3  
 3—Fore wings uniformly deep fumose.....*fumosus*  
 —Fore wings marked with hyaline, greyish brown and dark brown.....4  
 4—Fore wings with three hyaline or subhyaline bands.....*quadrifasciatus*  
 —Fore wings spotted, little or no indications of bands.....*madescens*.

**Peripsocus fumosus** Banks

*Peripsocus fumosus* Banks. N. Y. Ent. Soc. Jour. **11**: 237.  
 1903.

This Colorado species has uniformly brown wings, a character which is sufficient to separate it from the known members of this genus. The head of the female holotype is brown with a pair of faint darker spots behind ocelli and with faint mesally directed lines on the clypeus.

Colorado: "S. W. Colo." 1 ♀ (Oslar) M. C. Z. Holotype.

**Peripsocus madescens** (Walsh)

*P(socu)s madescens* Walsh. Ent. Soc. Phila. Proc. **2**: 186.  
 1863.

*Peripsocus madescens* Hagen. Verh. zool.-bot. Ges. Wein. **16**:  
 210. 1866.

Female:

Length of body 2.1 mm. ave. of 10 individuals.

Length of fore wings 2.5 mm. ave. of 10 individuals.

Length of antennæ 1.45 mm. ave. of 10 individuals.

Similar to *P. quadrifasciatus* in markings and in general appearance, more intensely colored throughout. Wings (Pl. XXI, Fig. 2) bear a characteristic pattern of irregular areas of hyaline, greyish brown, and dark brown; there are no definite bands. In general two dark brown irregular spots are found in the larger cells while in the smaller ones (pterostigma, R<sub>3</sub>, M<sub>1</sub>, and M<sub>2</sub>) a single spot. Two or more hyaline spots are found in each cell. These spots vary in size and shape, and to some extent, in distribution, with each specimen. The greyish brown

borders the veins and covers those portions of the wings not mentioned. Veins distinct, dark brown. Hind wing uniformly pale greyish brown.

Abdomen whitish or frequently marked coarsely and profusely with grey or purplish grey. Genitalia brown (Pl. XIX, Fig. 1). The subgenital plate is an inverted V in shape and is composed of two parts; the basal portion consists of the pair of rather wide lateral plates which are united distally and there delimited by a wide, concave margin. The distal portion or egg-guide is short, constricted proximally, then gradually narrows to a blunt pointed apex; a pair of strongly chitinized strips extend about halfway along the lateral margin and a larger and slightly longer part extends cephalad (where they are visible below each lateral plate of the subgenital plate). The lateral gonapophyses very small, pilose and lobe-like. The projection from the rod between the lateral and dorsal gonapophyses long, slender—a flattened L in shape. Suranal plate almost equilateral triangular in shape, with a small non-chitinized triangle proximally.

New York: Ithaca, July 11, 1926, 3 ♀, Aug. 6, 1926, 1 ♀, Aug. 24, 1924, 4 ♀, Sept. 6, 1926, 4 ♀, Sept. 12, 1926, 1 ♀, Sept. 26, 1926, 1 ♀; Woodwardia Swamp, Tompkins Co., Aug. 10, 1924, 5 ♀; McLean Reservation, July 16, 1924, 1 ♀; Enfield Center, Sept. 30, 1927, 2 ♀ (Chester Rea) on willow woodpile; Little Valley, Sept. 17, 1926, 1 ♀; Penn Yan, Aug. 2, 1925, 2 ♀; Wells-ville, Sept. 15, 1925, 1 ♀; Howard, July 5, 1924, 3 ♀; Richburg, Sept. 16, 1925, 1 ♀; Cinnamon Lake, Schuyler Co., July 4, 12, 1924, 5 ♀; Hunter, Aug. 16, 1925, 5 ♀ miscellaneous beating; Ballston Lake, July 14, 1926, 1 ♀; Fairhaven, Sept. 7, 1924, 1 ♀; Michigan Mills, Lewis Co., Sept. 1, 1926, 27 ♀ beating, mostly spruce; Parkers, Lewis Co., Sept. 2, 1926, 7 ♀; Paul Smiths, Aug. 31, 1927, 43 ♀ beating, mostly larch and spruce; Nigger Pond, Oswego Co., Sept. 3, 1926, 4 ♀ on larch; Whetstone Gulf, Lewis Co., Sept. 2, 1926, 11 ♀ on dead hemlock; Adirondack Lodge, Essex Co., Sept. 2, 1927, 4 ♀.

Maine: Houlton, Aug. 26, 1925, 1 ♀ (C. R. C.).

Illinois: Belleville, Aug. 12, 1926, 1 ♀ (C. R. C.).

North Carolina: Blowing Rock, Oct. 10, 1923, 1 ♀ (C. & B.).

Georgia: Tiger, Oct. 18, 1926, 1 ♀ (C. & B.).

Florida: The Glen, Marion Co., Mar. 6, 1927, 8 ♀ (M. D. Leonard); Micanopy, Mar. 6, 1927, 1 ♀ (Borrows).

The description given by Walsh of *madescens* is sufficient to distinguish the species; the types are non-existent. *Madescens* is commonly found on dead or partially dead spruce, balsam, hemlock and larch but is occasionally found on other trees. The male is unknown to me. *P. alboguttatus* Dalman of Europe is closely related, or possibly identical with *madescens*.

#### *Peripsocus madidus* Hagen

*Psocus madidus* Hagen. Syn. Neuropt. of N. America, p. 12, 1861. (*Partim*).

*P(socu)s permadidus* Walsh. Ent. Soc. Phila. Proc. 2: 185. 1863.

*Peripsocus madidus* Hagen. Verh. zool.-bot. Ges. Wein. 16: 210. 1866.

*Peripsocus permadidus* Banks. Cat. Neuropt. Ins. p. 8, 1907.

Female (*macropterous*):

Length of body 2.35 mm. ave. of 21 individuals.

Length of fore wings 2.55 mm. ave. of 10 individuals.

Length of antennæ 2.65 mm. ave. of 21 individuals.

Readily distinguished by the presence of a pair of dark fuscous spots on the vertex and by the single shade of pale greyish brown clouding the wings. (Pl. XXI, Fig. 4).

Head: In addition to the pair of dark spots on the vertex, the ocelli are completely covered by a large dark brown or black spot; the dotted areas on vertex indistinct; normally there is a small fuscous spot anteriorly on genæ; clypeus as in the other species, lineated with golden brown, in some individuals an area bordering the lateral margins, darker; labrum dark brown or black. Eyes small, dull bluish black.

Thorax: Tergal lobes shining dark brown or black, the median lobe less intensely colored; legs pale, tibia and tarsi light brown. Fore wing clouded with a single shade of pale greyish brown whereas in *quadrifasciatus* and *madescens* two shades are present. Two illy defined hyaline bands are distinguishable: a



rather broad one across the middle of the wing involving the basal half of the pterostigma; a narrower one dividing the basal half of the wing. Veins stout, light brown. Hind wings nearly hyaline with the veins faintly margined with pale greyish brown.

Abdomen white, banded with coarse, broad, broken lines of grey or purplish brown. The stripes are confined to tergites. Genitalia (Pl. XIX, Fig. 3) deep golden brown. Subgenital plate an inverted and spread U-shaped plate with the lateral pieces rather narrow. At the base of the "U" a wide, slightly concave line, showing where the plate is bent dorsally; there it consists of a pair of lateral triangular pieces separated by a large central triangular or diamond-shaped non-chitinized area which is so conspicuous as to be useful in recognizing the species at a glance. The distal portion of the subgenital plate or egg-guide bears chitinized strips laterally throughout its entire length, is longer than wide and broader proximally than distally; the distal margin is deeply notched. Lateral gonapophyses large, elongate and pilose. The projection from the chitinized strip connecting the gonapophyses of the ninth segment short, triangular. Sense tubercles on paraprocts rather small, pale. Suranal plate cap-like, short, wide, almost rectangular except that the distal margin is slightly convex.

Female (*brachypterous*):

The wings are of about three sizes. Those that average about .8 mm. long, 1.25 mm. and 1.6 mm. The venation may readily be recognized as that of *Peripsocus* in the larger winged individuals but as the wings diminish in size, aberrations and incomplete venation are common. (Pl. XXI, Fig. 11). The body markings are essentially identical with macropterous forms.

Male:

Length of body 2.1 mm. ave. of 10 individuals.

Length of fore wings 2.55 mm. ave. of 10 individuals.

Length of antennæ 2.05 mm. ave. of 10 individuals.

The male, while marked in general as the female, less robust throughout; spots on the vertex very small or obscured in dark individuals; the eyes ovate, very large—almost three times as large as female; antennæ longer and stouter. Fore wings are

possibly more nearly a uniform pale brown throughout than the female. Abdomen creamy white with a few coarse greyish brown bands; in dark individuals the dark brown of head, thorax and genitalia are in striking contrast to the white of the abdomen.

Genitalia (Pl. XIX, Fig. 6) symmetrical. The conspicuous parameres are fused. They are four times as long as at their widest measurement. The basal fourth is a narrow plate where it then forks and halfway each branch forks again, the outer pair of elements being very slender rods which gradually diverge until at about the distal fifth they almost meet and are then capped by a narrow sharp-pointed piece; the inner elements of the secondary forking are leaf-shaped, the basal half consists of an exceedingly slender pedicel while the narrow leaf-like portion gradually comes to a point distally. The hypandrium covers the distal half of the parameres; it bears a weakly chitinized triangular portion midway, the apex of which is at the distal margin; a pair of narrow strongly chitinized strips are on each side of the median line. The penis (?) is strongly chitinized and like *quadrifasciatus* may be likened to an anchor in shape—the lateral arms were not found crossed. Paraprocts elongate, the proximal half occupied by the large sense area and the distal half composed of two divisions, the larger apical part bulbous. Suranal plate an isosceles trapezoid with a circular chitinized area medianly.

New York: Ithaca, July 5, 1926, 3 ♀ 2 ♂, July 11, 1926, 12 ♀ 1 ♂ in dead leaves on fallen trees, July 24, 1927, 10 ♀ (2 *brachypterous*), July 25, 1925, 2 ♂ under loose bark, Aug. 6, 1926, 30 ♀ (10 *brachypterous*), 12 ♂ 2 nymphs, beating dead limbs, Aug. 15, 1926, 8 ♀ 6 ♂ 1 nymph, Aug. 22, 1926, 6 ♀ (2 *brachypterous*), 1 ♂, Aug. 28, 1926, 1 ♀ (P. P. Babiy), Aug. 30, 1926, 3 ♀ *brachypterous*, 4 ♂ 3 nymphs (P. P. Babiy) on *Plantus occidentalis*, Sept. 1, 1926, 2 ♀ 6 ♂ (P. P. Babiy), Sept. 6, 1926, 1 ♀, Sept. 12, 1926, 2 ♀, Sept. 26, 1926, 13 ♀ (6 *brachypterous*) 7 ♂ 2 nymphs, Oct. 2, 1925, 1 *brachypterous* ♀ under loose bark of sycamore; Olcott, Sept. 19, 1925, 1 ♂; Enfield Center, Sept. 30, 1927, 8 ♀ (1 *brachypterous*) 2 ♂ 2 nymphs (Chester Rea) on willow woodpile; McLean, July 31, 1926, 1 ♀; Richburg, Sept.

16, 1925, 6 ♀ in dead leaves; Wellsville, Sept. 15, 1925, 1 ♀; Barcelona, Sept. 19, 1925, 2 ♀; Ceres, Sept. 16, 1925, 9 ♀ 3 ♂ on dead limbs; Rock City, Sept. 16, 1925, 28 ♀ 10 ♂; Clarksburg, Sept. 18, 1925, 4 ♀; Sodus, Aug. 16, 1926, 1 ♀ 2 ♂ 2 nymphs on dead maple limb; Painted Post, Sept. 15, 1925, 1 ♀ 1 ♂ on tree trunks; Little Valley, Sept. 17, 1925, 2 ♀ 1 ♂; Stow, Sept. 17, 1925, 2 ♀; Ballston Lake, July 14, 1926, 2 ♀; Hudson, July 15, 1926, 1 ♀; Saratoga Springs, July 14, 1926, 1 ♀; Adirondack Lodge, Essex Co., Sept. 2, 1927, 1 ♂; Paul Smiths, Aug. 31, 1927, 6 ♀ 4 ♂; Nigger Pond, Oswego Co., Sept. 3, 1926, 3 ♀; Whetstone Gulf, Lewis Co., Sept. 3, 1926, 2 ♀; Parkers, Lewis Co., Sept. 2, 1926, 2 ♀ 1 ♂; Michigan Mills, Lewis Co., Sept. 1, 1926, 1 ♀ 2 ♂; Riverhead, L. I., Oct. 1, 1924, 1 ♂; Sea Cliff, L. I., Sept. 6, 1925, 7 ♀ 2 ♂; Cinnamon Lake, Schuyler Co., July 14, 1924, 1 ♂; "N. Y." 1 ♀ (Winthem) M. C. Z. Type series.

Maine: Seabasticook Lake, Aug. 24, 1925, 1 ♂ (C. R. C.).

Vermont: Pownal, Oct. 2, 1927, 1 ♀ (*brachypterous*) (S. C. Bishop).

Ohio: Sandusky, July 22, 1926, 1 ♀ (*brachypterous*) on trunk of elm tree in city.

Illinois: Anderson, Sept. 17, 1902, 5 ♀ 5 ♂ many nymphs. Bark of maple.

Kentucky: Valley View, June 28, 1925, 1 ♀; Quicksand, June 25, 1925, 1 ♂ misc. beating.

Tennessee: Bristol, Oct. 5, 1926, 2 ♂ (C. & B.) taken at light of Coca-cola stand.

Two species are found in Hagen's type of *madidus*. I am here considering the specimen from New York collected by Winthem as the holotype; the specimen from Dalton, Georgia, is *quadrifasciatus*. That Hagen had the New York specimen most in mind is indicated by the following points: he listed it first; the pair of spots on the occiput mentioned in his description are not found in other American species; he mentions "two paler obsolete bands" while in *quadrifasciatus* three hyaline or subhyaline bands may be distinguished; a label, probably Hagen's, on the New York form bears the following—"P. *madidus* Hagen, Ps. 4-striatus Harr. Ps. *permadidus* Walsh."

*Peripsocus permadidus* Walsh is synonymous with *madidus* Hagen; the types are non-existent but Walsh's description makes clear what species he had in mind.

Dead limbs on deciduous trees appear to be the favorite feeding and breeding grounds of *P. madidus*. It is a common species. As far as known this is the only American species of *Peripsocus* with short-winged females. Males are frequently taken throughout the season while males of *madescens* are not known to me and those of *quadrifasciatus* are rare.

#### *Peripsocus quadrifasciatus* Harris

*Psocus quadrifasciatus* Harris. Ento. Corresp. p. 331, 1869.

*Peripsocus madidus* Hagen. Verh. zool.-bot. Ges. Wein. 16: 210. 1866. (Partim).

Female:

Length of body 2.1 mm. ave. of 12 individuals.

Length of fore wings 2.4 mm. ave. of 12 individuals.

Length of antennæ 1.35 mm. ave. of 12 individuals.

Head: Vertex, covered with pale elongate golden brown dots except for a pair of unmarked crescents, one on each side of the ocelli; ocelli completely enclosed by a dark brown or blackish spot; clypeus covered with broad, nearly straight, pale, golden brown lines directed mesally; genæ unmarked; labrum brown, varying in intensity with the individual. Maxillary<sup>o</sup> palpus and antennæ light brown throughout. Eyes dull black.

Thorax: Tergal lobes shining dark brown, the median lobe not as deeply colored, the sutures white; pleuræ light brown with considerable paling; legs pale throughout. Wings (Pl. XXI, Fig. 3) light greyish brown except for three irregular, incomplete hyaline or greyish bands which are so spaced as to divide the wing into four nearly equal sections. The middle band is wide, sometimes H-shaped and centered by a definite brown spot proximally in cell  $R_5$ . The apical band narrow, and sometimes indistinct; it lies just beyond the pterostigma. Generally the marginal portion of the wing a pale greyish brown while the central portion between the bands darker, more brown than grey. Pterostigma opaque,  $R_1$  almost parallel with costa



throughout its course. Veins brown, distinct. Hind wing uniformly pale grey with a pale border at wing margin and on each side of veins.

Abdomen: Dull white, usually ringed with grey especially on the sides; in some individuals are distinguishable a series of about ten longitudinal greyish stripes (the musculature). Genitalia (Pl. XIX, Fig. 2) light brown. The basal portion of the subgenital plate roughly crescent-shaped and without a median cleft as in the other American species; the plate convex becoming sharply so distally. The egg-guide rectangular almost as wide as long, convex, bounded laterally by a pair of wide, straight, highly chitinized strips leaving a median portion which is weakly chitinized and beset with short spines; the distal margin is concave and pilose. The gonapophyses of the ninth segment arise from a roughly diamond-shaped frame, the small convex, pilose, lateral gonapophyses cover the extreme lateral angles while caudo-medianly arise the short, blunt dorsal gonapophyses. On this framework halfway lies a pair of long, slender, tongue-like pieces. Ventral gonapophyses of usual shape. Suranal plate a chitinized cap with a pair of roughly circular weakly chitinized spots proximally.

Male:

Length of body 1.5 mm. ave. of 10 individuals.

Length of fore wings 2.2 mm. ave. of 10 individuals.

Length of antennæ 1.85 mm. ave. of 7 individuals.

Wing markings as in female; body markings generally darker, sometimes obscured, especially on head. Eyes very large, ovate, nearly three times larger than female. Antennæ more robust. On costa of the fore wing just behind the pterostigma a curious thickening which is concave and three or more times longer than wide.

The abdomen slender, almost tubular. Genitalia (Pl. XIX, Fig. 7) symmetrical and featured by the broad Y-shaped plate or the fused parameres. Considerable variation has been observed in the proportional width of this plate at its base as compared with the widest distal measurement. Distally on it arise two pairs of processes; the upper and inner pair blunt pointed

and fused to the narrow chitinized portion of hypandrium; the lower outer pair are highly chitinized, bending sharply mesally and each element approaching the other closely and finally capped by a less highly chitinized funnel-like piece. The penis (?) is small, highly chitinized and suggesting an anchor in shape. Caudal margin of the hypandrium with definitely chitinized strips narrowing and finally disappearing mesally. Sense tubercles bulbous, situated proximally on a plate which is elongate, convex and of irregular outline. The suranal plate short, broad, and truncate distally, while the chitinization is confined to a marginal strip.

New York: Ithaca, July 5, 1926, 12 ♀, July 11, 1926, 27 ♀, July 25, 1925, 3 ♀ 2 nymphs under loose bark, Aug. 1, 1926, 7 ♀, Aug. 6, 1926, 18 ♀, Aug. 8, 1925, 7 ♀, Aug. 15, 1926, 25 ♀, Aug. 22, 1926, 10 ♀, Sept. 6, 1926, 1 ♀, Sept. 12, 1925, 10 ♀, Sept. 23, 1924, 1 ♀, Sept. 26, 1926, 13 ♀, Oct. 2, 1925, 1 ♀ feeding in numbers on bark of sycamore; Enfield Glen, Aug. 23, 1925, 6 ♀; McLean Reservation, July 31, 1926, 15 ♀ on dead hemlock, July 16, 1924, 6 ♀, Sept. 19, 1924, 1 ♀; Enfield Center, Sept. 30, 1927, 34 ♀ (Chester Rea) on willow woodpile; Woodwardia Swamp, Tompkins Co., Aug. 10, 1924, 8 ♀ 3 nymphs; Danby, Oct. 17, 1924, 1 ♀; Cinnamon Lake, Schuyler Co., July 4, 12, 1924, 9 ♀ on tree trunks; Montour Falls, Sept. 21, 1924, 9 ♀; Sodus, Aug. 16, 1926, 2 ♀ on dead maple limbs; Barcelona, Sept. 19, 1925, 2 ♀; Geneseo, Sept. 20, 1925, 15 ♀; Ceres, Sept. 16, 1925, 31 ♀ on dead limbs; Silver Creek, Sept. 18, 1925, 5 ♀; Stow, Sept. 17, 1925, 5 ♀; Painted Post, Sept. 15, 1925, 28 ♀ on tree trunks and dead limbs; Little Valley, Sept. 17, 1925, 6 ♀; Richburg, Sept. 16, 1925, 3 ♀; Elmira, Oct. 1, 1925, 7 ♀ on tree trunks; Penn Yan, Aug. 2, 1925, 1 ♀; Whetstone Gulf, Lewis Co., Sept. 2, 1926, 14 ♀; Michigan Mills, Lewis Co., Sept. 1, 1926, 101 ♀ miscellaneous beating hemlock, larch, spruce, willow, etc.; Paul Smiths, Aug. 31, 1927, 59 ♀ on dead larch, spruce, etc.; Parkers, Lewis Co., Sept. 2, 1926, 23 ♀; Nigger Pond, Oswego Co., Sept. 3, 1926, 20 ♀; Mt. McIntyre, Essex Co., Sept. 4, 1927, 4 ♀ taken at 4500 ft. confined exclusively to birch, July 24, 1925, 1 ♀ (C. & B.); Adirondaek Lodge, Essex Co., Sept. 2, 1927, 20 ♀; Chapel

Pond, Essex Co., July 19, 1925, 1 ♀ (C. & B.), Sept. 19, 1925, 3 ♀ (S. C. Bishop); Avalanche Lake, Essex Co., July 24, 1925, 2 ♀ 2 nymphs (C. & B.); Fairhaven, Sept. 7, 1924, 2 ♀; Ballston Lake, July 14, 1926, 1 ♀; Hudson, July 15, 1926, 1 ♀; Saratoga Springs, July 14, 1926, 2 ♀; Hunter, Aug. 16, 1925, 18 ♀ beating hemlock, etc., also under loose stones; Sea Cliff, L. I., Sept. 6, 1925, 22 ♀ miscellaneous beating; Baiting Hollow, Suffolk Co., L. I., Sept. 19, 1926, 1 ♀; Mineola, June 26, 1926, 1 ♀.

Maine: Presque Isle, Aug. 26, 1925, 2 ♀ (C. R. C.); Winterport, Aug. 29, 1925 1 ♀ (C. R. C.); Molunkus Pond, Aug. 25, 1925, 1 ♀ (C. R. C.); Falmouth, Aug. 20, 1925, 1 ♀ (C. R. C.); Southwest Harbor, Mt. Desert Island, Aug. 31, 1926, 3 ♀ (C. P. Alexander); Beech Mt., Mt. Desert Is., Sept. 12, 1926, 3 ♀ (C. P. Alexander).

Ontario, Canada: Pointe au Babil, 7 ♀ on ground hemlock (L. Giovannoli).

Massachusetts: Cambridge, 1 ♀ (Harris) Boston Society of Natural History. Holotype *P. quadrifasciatus*.

New Jersey: Englewood Cliff, Sept. 6, 1925, 5 ♀ on dead oak limbs.

Virginia: Spottswood, Oct. 4, 1926, 2 ♀ (C. & B.).

Kentucky: Brooklyn Bridge, June 29, 1925, 1 ♀.

Tennessee: Mill Creek, below falls on Mt. Leconte, Oct. 10, 1926, 8 ♀ 2 ♂ (C. & B.); Summit of Mt. Leconte (6500 ft.), Oct. 10, 1926, 1 ♂ (C. & B.); Laurel Creek, Sevier Co., Oct. 8, 1926, 2 ♀ (C. & B.).

North Carolina: Base of Mt. Pisgah, Buncombe Co., Oct. 13, 1926, 1 ♀ (C. & B.); Cowee Mts., Swain Co., Oct. 15, 1926, 1 ♀ (C. & B.); Waynesville, Oct. 14, 1926, 3 ♀ (C. & B.); Jacksonville, Oct. 23, 1926, 1 ♀ (C. & B.).

Georgia: Dalton, 1 ♀ (O. Sacken) M. C. Z. Paratype of *P. madidus*; Tiger, Oct. 18, 1926, 6 ♀ (C. & B.).

Florida: Rock Bluff, Apr. 4, 1927, 1 ♀ (C. R. C.), Apr. 25, 1924, 1 ♀ (T. H. Hubbell); Camp Torreya, Liberty Co., 1 ♀ (T. H. Hubbell); The Glen, Marion Co., Mar. 6, 1927, 1 ♂ (M. D. Leonard).

Washington: Seattle, Aug. 7, 1927, 26 ♀ 43 ♂ (C. R. C.); Sol Duc Hot Springs, Aug. 12, 1927, 4 ♀ (C. R. C.); Edmonds, Aug.

16, 1927, 14 ♀ (C. R. C.); Longmire, Aug. 22, 1927, 22 ♀ (C. R. C.).

California: Palo Alto, Aug. 4, 1927, 1 ♀ on dead *Salix* branch (J. D. Hood).

Hagen's types of *Peripsocus madidus* includes two species. The one from Dalton, Georgia, is what I here consider *Peripsocus quadrifasciatus* Harris. The original description of *quadrifasciatus* appears in Harris "Entomological Correspondence" published in 1869. Just the left wing of one specimen remains of the original specimens in the collection of the Boston Society of Natural History. In Harris' notes at this institution appear this reference to the species: "Cambridge on fence north of Mr. Newell's garden in college yard, Sept. 9, 1837, in great numbers together." I have been unable to find any difference between *quadrifasciatus* and *P. subfasciatus* Rambur of Europe. The former species is so common and widespread in this country as to appear indigenous and therefore until male specimens can be carefully compared (I have examined only female specimens of *P. subfasciatus*) I shall consider *quadrifasciatus* distinct. The males of this species are rare as an examination of the distribution data will indicate. Males taken in the Pacific Northwest by Prof. C. R. Crosby appears identical with the forms taken in Eastern United States. More than one generation of *quadrifasciatus* must occur in the North; it is among the first to appear in early summer and among the last to disappear in the fall. In New York it is the most common woodland form. One finds it breeding in a great variety of situations; on cliff walls, on stones, on tree trunks, or having a home among dead or living hemlock needles or the leaves of deciduous trees.

#### ***Peripsocus stagnivagus* new species**

Female:

Length of body 1.4 mm. ave. of 2 individuals.

Length of fore wings 1.5 mm. ave. of 2 individuals.

Length of antennæ 1.0 mm. measurement of 1 individual.

Readily distinguished from the other American members of the genus by its small size. Body markings similar to *quadrifasciatus* with the following differences: blackish spot enclosing ocelli smaller; tergal lobes on thorax a deep golden brown, median lobe as deeply colored as lateral ones;



the abdomen light greyish brown with the markings most distinct anteriorly on the sides. The wings (Pl. XXI, Fig. 5) pale greyish brown with several spots and streaks, slightly darker, brown, in the fore wings. In one specimen a series of six pale spots distally, one spot to each cell from  $R_1$  to  $M_3$  inclusive. Veins distinct, pale brown.

Genitalia (Pl. XIX Fig. 5) light brown. The subgenital plate with an inverted V-shaped basal portion, the arms rather narrow as in *madidus*. This basal portion is terminated by being bent under suddenly and at which point arises the short distal portion or egg-guide. It is generally similar in shape to the corresponding piece in *quadrifasciatus*. It differs in being slightly wider than long and while the lateral margins are marked by chitinized strips these supports have at their base slender, triangular, laterally directed plates which are relatively wide at point of attachment and become pointed distally. The lateral gonapophyses large, nearly attaining the base of the dorsal gonapophyses. Suranal plate with rounded distal margin and a crescent-shaped non-chitinized area basally.

North Carolina: Lake Waccamaw, Oct. 21, 1926, 1 ♀ (C. & B.). Holotype. Knotts Island, July 24, 1929, 1 ♀ Paratype.

South Carolina: Sumter, Oct. 20, 1926, 1 ♀ (C. & B.). Paratype.

#### *Ectopsocus* MacLachlan 1899

Type: *E. briggsi* MacLachlan 1899.

The cross-vein r-m is present in the hind wings of members of this genus; the forewings as in *Peripsocus* with Cu unbranched. A few short hairs occur on the veins and on wing margin but they are not readily visible. In 1901 Enderlein erected *Micropsocus* based on the presence of hairs on veins and wing margins, assuming that *Ectopsocus* was unhaired. Later he discovered this was not the case. The genitalia of the female consists of two pairs of gonapophyses and the subgenital plate bears what may be called an egg-guide. Male genitalia are extremely complicated, asymmetrical, while on the dorsum are elaborate secondary structures presumably concerned with copulation.

#### *Ectopsocus californicus* (Banks)

*Peripsocus californicus* Banks. Jour. N. Y. Ent. Soc. **11**: 237. 1903.

Female:

Length of body 1.95 mm. ave. of 10 individuals.

Length of fore wings 1.9 mm. ave. of 10 individuals.

Length of antennæ 1.6 mm. ave. of 10 individuals.

Markings tan, the wings hyaline with brown spots at ends of veins.

Head: Dotted areas on vertex tan; each ocellus with a crescent of orange pigment; clypeus indistinctly lineated with broad mesally directed tan lines; genæ and labrum unmarked. Maxillary palpus and antennæ concolorous with head, darkest apically while segment 1 and 2 of antennæ, light brown. Eyes dull bluish black.

Thorax: Dorsum pale, with the tergal lobes incompletely covered with tan; pleuræ generally pale with an illy defined tan and brown stripe midway. Legs pale, tibia and tarsi tan. Wings (Pl. XXI, Fig. 8) hyaline, fore wings with spots ranging from tan to brown at end of the veins and spot at junction of Rs with M. Pterostigma opaque, rectangular, about four times longer than wide; a brown spot at each end of cell. Veins distinct, tan, darkening to light brown distally. Hind wing unmarked.

Abdomen: Tergites with broad greyish brown stripes fading or disappearing dorsally. Genitalia (Pl. XVI, Fig. 13) tan, the subgenital plate considerably longer than wide, with the chitinization confined to a pair of lateral stripes. A distal process resembles the letter W due to the presence of elongate lateral lobes and a much shorter triangular middle portion. A small distinct chitinized area at the angles of the distal margin while just below these a concave row of six distinct bristles. The gonapophyses consist of a pair of short, slender blades directed mesally below the subgenital plate and to which is attached proximally a pair of long slender curved gonapophyses extending as far caudally as the end of lateral lobes of the subgenital plate. The proximal third of this piece is very slender and the lateral surface is sparsely pilose. Sense tubercles of paraprocts brown, very small. Suranal plate short, distal margin wide bearing a row of four conspicuous bristles.

Male:

Genitalia (Pl. XIX, Fig. 10). Hypandrium large, rectangular, the greatest dimension being in depth, the chitinization being

confined to the lateral and distal marginal area; laterally at the distal margin arise a pair of short curved hooks. The parameres and what is probably a penis more or less united, asymmetrical. Parameres nearly independent consisting of a pair of scroll-like arms widest at base, becoming dilated, then suddenly narrowing to a very slender rod with a blunt pointed apex; lying between these arms distally a structure—probably the united inner pair of parameres—shaped like the letter  $\pi$ . The right arm of the  $\pi$ -shaped piece attached to the base of a large, strongly chitinized sickle-shaped piece which proceeds to the left; below and to the right lies an outer plate bound at the base by a highly chitinized strip, while behind, the two horizontally directed plates are visible; at the base of the left paramere a C-shaped piece. Sense tubercles of paraprocts very small. The apex of the suranal plate weakly chitinized bearing four spines noticed in the female. Cephalic of apex is found a large concave plate bound by a straight chitinized strip distally and by thin nearly parallel lateral strips which converge mesally near the small highly chitinized crescent-shaped piece lying midway proximally.

New York: Sea Cliff, L. I., Sept. 6, 1926, 20 ♀ in dead leaves, etc.

Virginia: Spottswood, Oct. 4, 1926, 7 ♀ (C. & B.); New Market, Oct. 4, 1926, 1 ♀ (C. & B.); Blue Ridge Mts. near Roanoke, Oct. 7, 1923, 6 ♀ 1 nymph (C. & B.); Fredericksburg, Oct. 28, 1926, 1 ♀ (C. & B.); Blacksburg, Oct. 4, 1926, 22 ♀ 7 nymphs (C. & B.).

Kentucky: Quicksand, June 25, 1925, 3 ♀ 1 nymph.

North Carolina: Nantahala Gap, Macon Co., Oct. 16, 1926, 12 ♀ 2 nymphs (C. & B.); Mine Hole Gap, Buncombe Co., Oct. 17, 1923, 2 ♀ (C. & B.); base of Mt. Pisgah, Buncombe Co., Oct. 19, 1923, 1 ♀ (C. & B.), Oct. 13, 1926, 8 ♀ (C. & B.); Frying Pan Gap, Mt. Pisgah, Oct. 13, 1926, 1 ♀ (C. & B.); Andrews, Oct. 17, 1926, 4 ♀ (C. & B.); Montreat, Oct. 16, 1923, 2 ♀; Marshall, Oct. 12, 1926, 1 ♀; Weldon, Oct. 26, 1926, 2 ♀; Olean, Oct. 13, 1926, 2 ♀ (C. & B.).

Tennessee: Laurel Creek, Sevier Co., Oct. 8, 1926, 6 ♀ (C. & B.); Mill Creek, below falls on Mt. Leconte, Oct. 10, 1926, 10 ♀ (C. & B.).

Georgia: Tiger, Oct. 18, 1926, 12 ♀ (C. & B.); Tallulah Falls, Oct. 18, 1926, 1 ♀ (C. & B.); top of Blue Ridge, Towns and Rabun Co. lines, Oct. 18, 1926, 2 ♀ (C. & B.).

Florida: Orlando, Jan. 27, 1927, 18 ♀; April, 1927, 1 ♀ on citrus; Dec. 17, 1926, 5 ♀ (All O. C. McBride); Lake Hall, Leon Co., April 13, 1927, 8 ♀ 2 nymphs (C. R. C.); Dead Lake, Wewahitchka, April 6, 1927, 6 ♀ (C. & B.).

California: Blue Lake, July 27, 1927, 1 ♂ (J. D. Hood) on dead *Salix*. "Calif." 1 ♀ 1 ♂ (M. C. Z.). Holotype and Allotype.

#### *Ectopsocus pumilis* (Banks)

*Peripsocus pumilis* Banks. Mus. Comp. Zool. Bul. 64: 313. Pl. 6, Fig. 79. 1920.

Female:

Length of body 2.0 mm. ave. of 7 individuals.\*

Length of fore wings 1.7 mm. ave. of 10 individuals.

Length of antennæ 1.1 mm. ave. of 10 individuals.

Head, thorax and genitalia concolorous, a deep greyish orange; abdomen pale, faintly and broadly ringed with pinkish grey.

Head: Vertex sparsely clothed with short hairs. Antennæ and maxillary palpus concolorous with head, the former paling distally. Eyes dull bluish black. Ocelli large, pale; ocellar interval concolorous with vertex. The head is wide and short.

Thorax: Several conspicuous short hairs on dorsum. Wings (Pl. XXI Fig. 15) tan or pale salmon throughout. Veins stout reddish brown. M usually joined to Rs for only a short distance, varying to individuals with a short cross-vein. Hind wing slightly paler than fore wing; cross-vein r-m distinct.

Genitalia characterized by a strongly chitinized *asymmetrical* interior genital plate (Pl. XIX, Fig. 12). The subgenital plate is triangular with lateral strip definitely chitinized forming a V. The apex is slightly depressed, weakly chitinized. But at-

\* Some females full of eggs may have a body measurements as much as 2.6 mm.



tached below and to the inner surface a short wide plate which at its attachment is strongly chitinized. The only gonapophyses-like structures are the pair of stout curved pointed arms arising in a normal position from the tergites. These pieces bear four hairs distally: three in a row along inner margin, and one near outer margin. The interval between these "gonapophyses" at their base bridged over and supports the inner genital plates: the proximal part of this piece is circular, with a large median hole. Attached to this punctured plate cephalically are two asymmetrical, oblong, concave plates. They are connected by a weakly chitinized portion extending from the mesal margin of the left one to the inner convex surface of the right one. Sense tubercles on paraprocts small, proximal; a row of about four long hairs a short distance distal of sense tubercles; at distal margin of paraprocts an area covered with short hairs. Suranal plate triangular, pilose, a conspicuous pair of long hairs at the weakly chitinized apex.

Male:

Length of body 1.7 mm. ave. of 10 individuals.

Length of fore wings 1.5 mm. ave. of 10 individuals.

Length of antennæ 1.1 mm. ave. of 10 individuals.

Slightly smaller than female, eyes no larger; abdomen slender, more deeply colored on the average (in some individuals strongly marked with purplish grey). Genitalia (Pl. XIX, Fig. 11) asymmetrical. Hypandrium very large, nearly square. A little distal of halfway laterally, arise a pair of curved arms which are fused to the hypandrium but extend a short distance beyond its distal margin. The mesal margin of these arms strongly defined while attached to the lateral margin a strip connected to the elaborate genital armature on dorsum. The distal margin of hypandrium bears a row of long hairs. Attached at a point mesally on proximal margin a narrow weakly chitinized plate. A large U-shaped piece, the base of the parameres, gives rise to a pair of slender twisted, then finely drawn out pointed prongs. The interval between the origin of these prongs is spanned by an inverted U (the inner parameres?) which widens suddenly medianly and bears a small tubercle on the otherwise straight

distal margin. Attached to this bridge and proceeding cephalically into abdomen a very long, tongue-like plate. The strongly chitinized piece (the penis?) lying below the bridge is a complicated series of twisted plates. A median and most caudal piece is elongate, gradually widening distally and ending abruptly with an uneven rounded margin. On its left and almost its length a pointed prong which is divided proximally. The upper branch is unattached. The inner arm gives rise to two plates, of which the caudal one is narrow, curves up, and terminates in a point medianly at base of the first named structure; the cephalic plate parallels roughly the caudal one but is much broader, the upper margin produced into two prongs medianly and one on the left. An elongate, much twisted plate lies cephalic to the structures just named. Paraprocts weakly chitinized, sense tubercles distinct. The striking dorsal genital armature is concave (Pl. XIX, Fig. 4) the chitinization forming an elongate "O." The cephalic portion consisting of a large, flat, blunt, mesally curved prong on the left and a smaller prong on the right which curved mesally and then laterally; at origin of right prong a short, nearly square plate. Caudally the "O" curves up into a crescent-shaped plate.

New York: Riverhead, L. I., Oct. 1, 1924, 1 ♀ 1 ♂; Sea Cliff, L. I., Sept. 6, 1925, 8 ♀ 2 ♂ in dead oak leaves which were still attached to cut limbs; Long Pond, Suffolk Co., Sept. 19, 1926, 10 ♀ 10 ♂ in dead oak leaves on broken branch.

Virginia: Lynnhaven Inlet, Oct. 27, 1926, 2 ♀ 3 ♂ (C. & B.).

Kentucky: Quicksand, June 25, 1925, 14 ♀ 8 ♂ breeding in straw and débris indoors, 3 ♂ entangled in wet paint on newly painted house (associated with *Lachesilla pedicularia* L.).

Missouri: Creve Coeur Lake, Aug. 4, 1926, 1 ♀ (C. R. C.).

Tennessee: Mill Creek, below falls on Mt. Leconte, Oct. 10, 1926, 1 ♀ (C. & B.), also 1 ♂ at summit.

North Carolina: Summit of Big Bald, Pisgah Range, Oct. 13, 1926, 2 ♂ (C. & B.).

Georgia: Towns and Rabun Co. line, Oct. 18, 1926, 7 ♀ 4 ♂ (C. & B.); Tiger, Oct. 18, 1926, 1 ♂ (C. & B.); Spring Creek, Seminole Co., April 11, 1927, 2 ♂ (C. R. C.).

Louisiana: Baton Rouge, Feb. 15, 1927, 10 ♀ 12 ♂ (O. W. Rosewall) at windows of feed barn.

Florida: Orlando, Aug. 2, 1926, 3 ♀ 2 ♂ (O. C. McBride); Jan., 1927, 2 ♀ 5 ♂ (O. C. McBride), April, 1927, 1 ♀ (C. P. Alexander); Dead Lake, April 6, 1927, 2 ♀ 3 ♂ (M. D. Leonard); Monticello, 1 ♀ (?) (Scammell) M. C. Z. Holotype.

The occurrence of *Ectopsocus pumilis* Banks in dwellings and breeding in many of the same situations as *Lachesilla pedicularia* L. suggests the possibility of this species being cosmopolitan in distribution and that *pumilis* is a synonym of some earlier named member of the genus. With material at hand it should be a simple matter to establish these points, since the genitalia in both sexes present a wealth of detail. *E. pumilis* is Southern in range. I do not know of specimens being taken North of Long Island, New York.

#### EXPLANATORY NOTE ON DISTRIBUTION DATA

The order followed in citing collections is as follows: locality, date, number of individuals of each sex; collector in parenthesis (omitted when author is collector); museum where specimens may be found (omitted when in author's collection), and finally miscellaneous note such as habitat, rank in type series and others. Omission of collector in listing specimens prior to 1924 and those credited to the several museums is due to incomplete data rather than that the author collected the specimens. The few abbreviations of collectors and institutions are:

(C. R. C.)—C. R. Crosby, Professor of Entomology at Cornell University.

(C. & B.)—Prof. C. R. Crosby and Dr. S. C. Bishop, Assistant Professor of Zoology at the University of Rochester.

M. C. Z.—The Museum of Comparative Zoology at Harvard University.

I. N. H. S.—Illinois Natural History Survey.

P. A. N. S.—Philadelphia Academy of Natural Sciences.

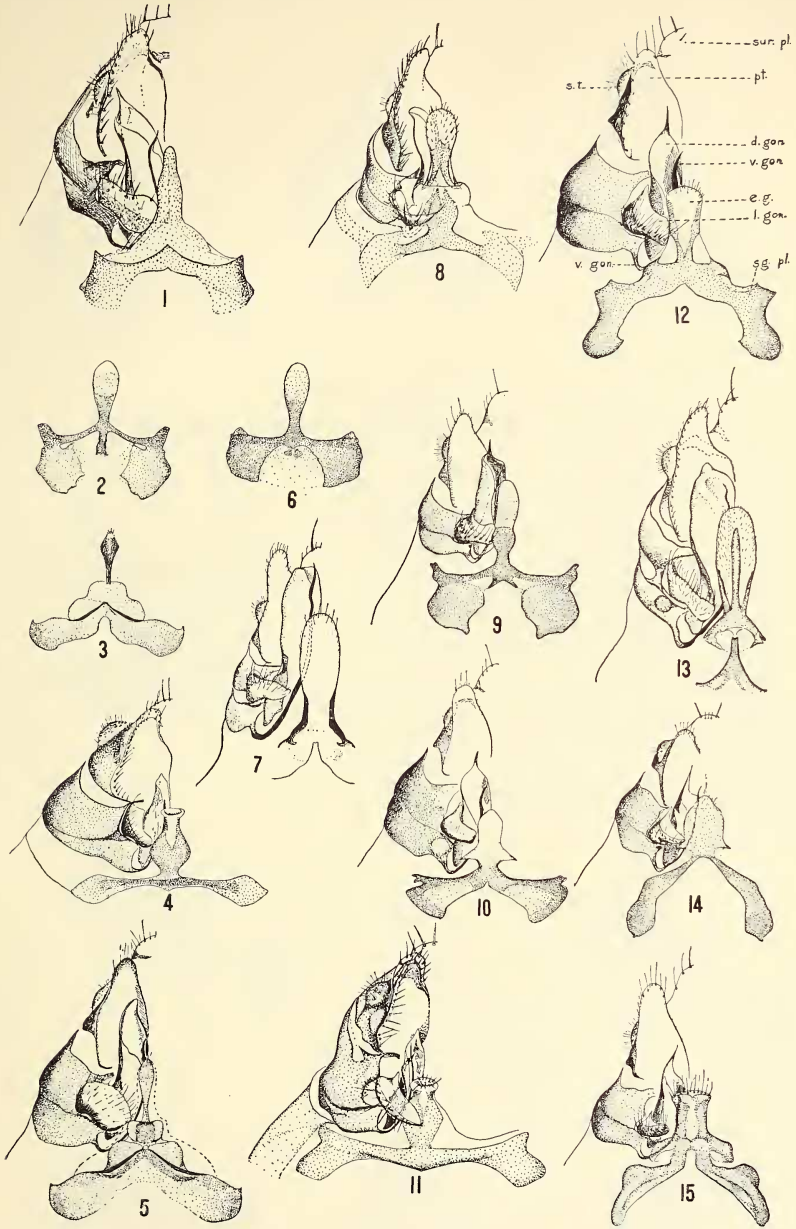
N. Y. S. M.—New York State Museum, Albany, N. Y.

## PLATE XII

Ventral view of genitalia and terminal abdominal segments. Structures *in situ*.

- Figure 1. *Psocus crosbyi* n. sp. ♀  
 Figure 2. *Psocus montivagus* n. sp. ♀ (only subgenital plate and egg-guide.)  
 Figure 3. *Psocus floridanus* Banks ♀ (only subgenital plate and egg-guide).  
 Figure 4. *Psocus venosus* Burmeister ♀  
 Figure 5. *Psocus striatus* Walker ♀  
 Figure 6. *Psocus petiolatus* Banks ♀ (only subgenital plate and egg-guide).  
 Figure 7. *Psocus purus* Aaron ♀  
 Figure 8. *Psocus hoodi* n. sp. ♀  
 Figure 9. *Psocus confraternus* Banks ♀  
 Figure 10. *Psocus variabilis* Aaron ♀  
 Figure 11. *Psocus trifasciatus* Prov. ♀  
 Figure 12. *Psocus texanus* Aaron ♀ sur. pl = suranal plate, pt. = paraproct, s. t. = sense tubercle of paraproct, d. gon. = dorsal gonapophyses, l. gon. = lateral gonapophyses, v. gon. = ventral gonapophyses, e. g. = egg-guide, sg. pl. = subgenital plate.  
 Figure 13. *Psocus novæscotiæ* Walker ♀  
 Figure 14. *Psocus quietus* Hagen ♀  
 Figure 15. *Psocus bisignatus* Banks ♀

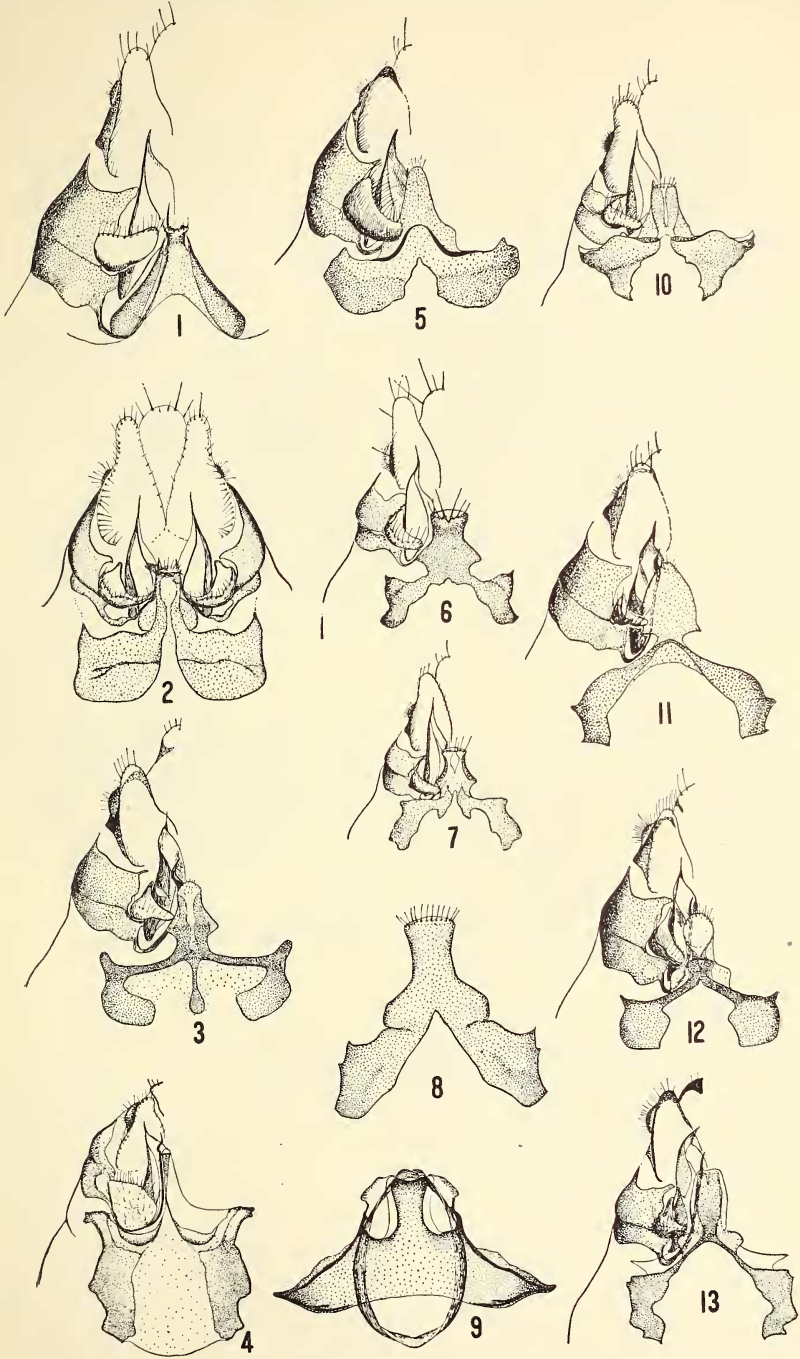




## PLATE XIII

Ventral view of genitalia and terminal abdominal segments. Structures *in situ*.

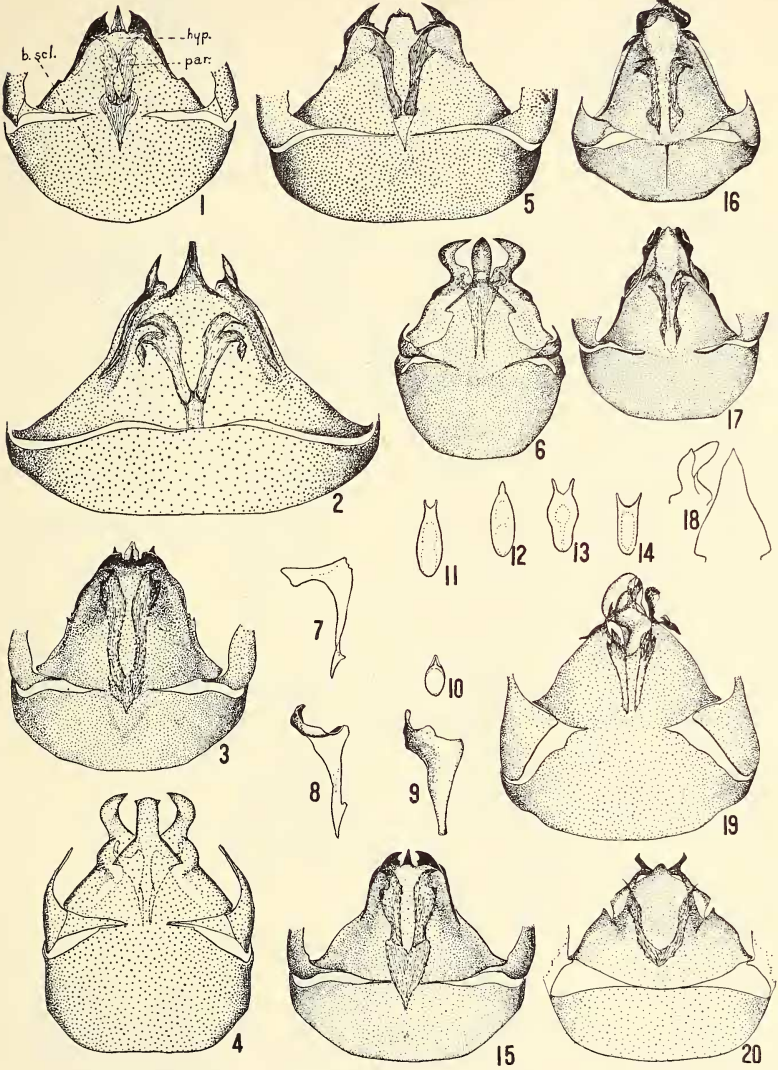
- Figure 1. *Psocus elegans* Banks ♀
- Figure 2. *Psocus moestus* Hagen ♀
- Figure 3. *Psocus lithinus* n. sp. ♀
- Figure 4. *Psocus leidyi* Aaron ♀
- Figure 5. *Psocus atratus* Aaron ♀
- Figure 6. *Psocus pollutus* Walsh ♀
- Figure 7. *Psocus slossonæ* Banks ♀
- Figure 8. *Psocus infumatus* Banks ♀ (subgenital plate and egg-guide)
- Figure 9. *Psocus venosus* Burm. ♂ hypandrium and parameres.
- Figure 10. *Psocus quæsitus* n. sp. ♀
- Figure 11. *Psocus oregonus* Banks ♀
- Figure 12. *Psocus inornatus* Aaron ♀
- Figure 13. *Psocus oppositus* Banks ♀



## PLATE XIV

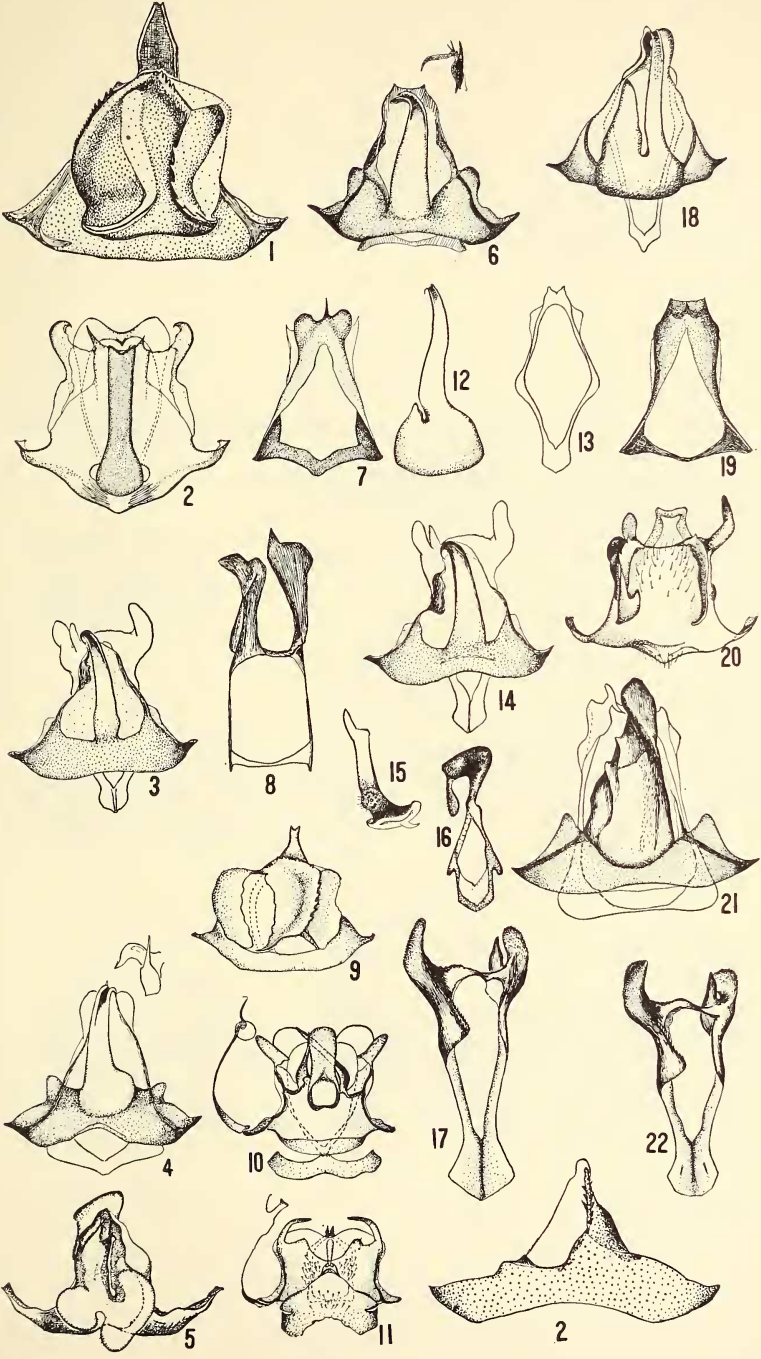
- Figure 1. *Psocus subapterous* n. sp. ♂ Hypandrium and parameres.  
 b. scl. = basal sclerite, hyp. = hypandrium, par. = parameres.
- Figure 2. *Psocus longipennis* n. sp. ♂ Hypandrium and parameres.
- Figure 3. *Psocus quietus* Hagen ♂ Hypandrium and parameres.
- Figure 4. *Psocus infernicolus* n. sp. ♂ Hypandrium and parameres.
- Figure 5. *Psocus inornatus* Aaron ♂ Hypandrium and parameres.
- Figure 6. *Psocus confraternus* Banks ♂ Hypandrium and parameres.
- Figure 7. *Psocus montivagus* n. sp. ♂ Left paramere.
- Figure 8. *Psocus confraternus* Banks ♂ Left paramere.
- Figure 9. *Psocus petiolatus* Banks ♂ Left paramere.
- Figure 10. *Psocus petiolatus* Banks ♂ Apex of hypandrium from behind.
- Figure 11. *Psocus montivagus* n. sp. ♂ Apex of hypandrium from behind.
- Figure 12. *Psocus confraternus* Banks ♂ Apex of hypandrium from behind.
- Figure 13. *Psocus bifasciatus* Latr. ♂ Apex of hypandrium from behind.
- Figure 14. *Psocus infernicolus* n. sp. ♂ Apex of hypandrium from behind.
- Figure 15. *Psocus subquietus* n. sp. ♂ Hypandrium and parameres.
- Figure 16. *Psocus lithinus* n. sp. ♂ Hypandrium and parameres.
- Figure 17. *Psocus persimilis* Banks ♂ Hypandrium and parameres.
- Figure 18. *Psocus petiolatus* Banks ♂ Apex of hypandrium diagrammatic).
- Figure 19. *Psocus variabilis* Aaron ♂ Hypandrium and parameres.
- Figure 20. *Psocus oppositus* Banks ♂ Hypandrium and parameres.





## PLATE XV

- Figure 1. *Psocus hoodi* n. sp. ♂ Hypandrium and parameres.  
 Figure 2. *Psocus desolatus* n. sp. ♂ Hypandrium and parameres.  
 Figure 3. *Psocus floridanus* Banks ♂ Hypandrium and parameres.  
 Figure 4. *Psocus infumatus* Banks ♂ Hypandrium and parameres.  
 Figure 5. *Psocus leidy* Aaron ♂ Hypandrium and parameres.  
 Figure 6. *Psocus bisignatus* Banks ♂ Hypandrium and parameres.  
 Figure 7. *Psocus infumatus* Banks ♂ Parameres.  
 Figure 8. *Psocus insulanus* n. sp. ♂ Parameres.  
 Figure 9. *Psocus novæscotiæ* Walker ♂ Hypandrium and parameres.  
 Figure 10. *Psocus quæsitus* n. sp. ♂ Hypandrium and parameres.  
 Figure 11. *Psocus slossonæ* Banks ♂ Hypandrium and parameres.  
 Figure 12. *Psocus maculosus* (Banks) ♂ Median ridge on hypandrium.  
 Figure 13. *Psocus maculosus* (Banks) ♂ Parameres.  
 Figure 14. *Psocus striatus* Walker ♂ Hypandrium and parameres.  
 Figure 15. *Psocus leidy* Aaron ♂ Left paraprocts.  
 Figure 16. *Psocus leidy* Aaron ♂ Parameres.  
 Figure 17. *Psocus striatus* Walker ♂ Parameres.  
 Figure 18. *Psocus moestus* Hagen ♂ Hypandrium and parameres.  
 Figure 19. *Psocus bisignatus* Banks ♂ Parameres.  
 Figure 20. *Psocus purus* Walsh ♂ Hypandrium and parameres.  
 Figure 21. *Psocus texanus* Banks ♂ Hypandrium and parameres.  
 Figure 22. *Psocus floridanus* Banks ♂ Parameres.  
 Figure 23. *Psocus insulanus* n. sp. ♂ Hypandrium (3 missing from Fig. 23 on plate).

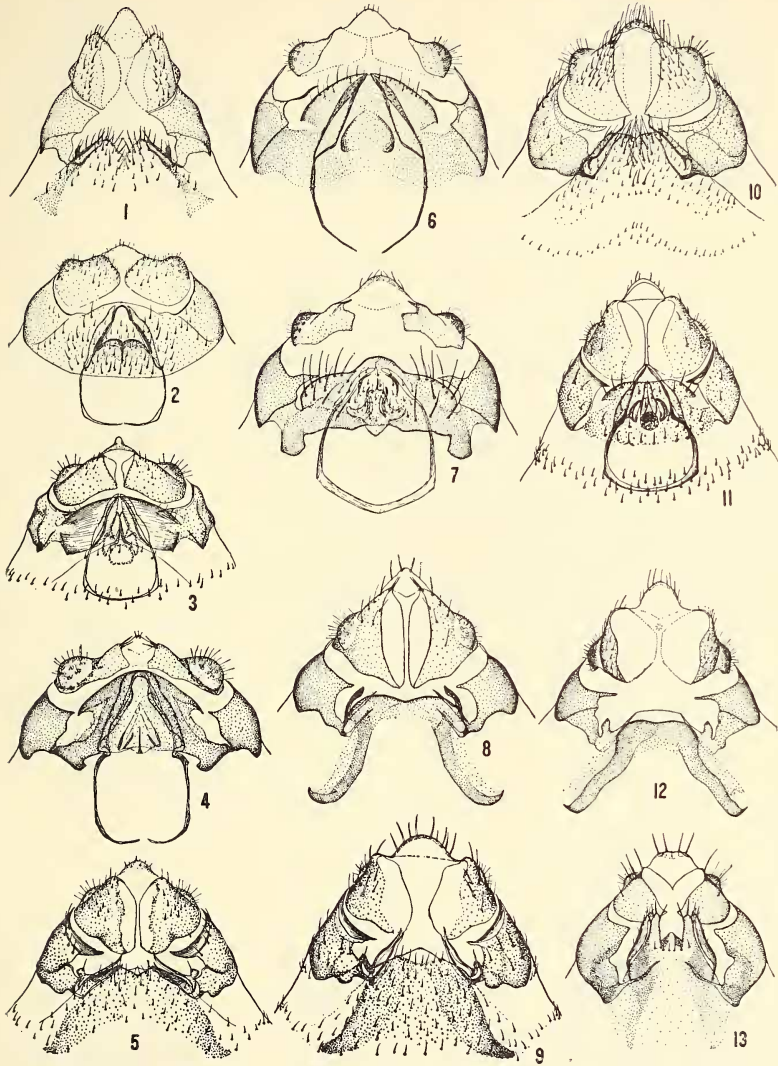


## PLATE XVI

Ventral view of genitalia and terminal abdominal segments. Structures  
*in situ*.

- Figure 1. *Cæcilius quillayute* n. sp. ♀
- Figure 2. *Cæcilius aurantiacus* Hagen ♂
- Figure 3. *Cæcilius confluens* Walsh ♂
- Figure 4. *Teliapsocus conterminus* (Walsh) ♂
- Figure 5. *Cæcilius confluens* Walsh ♀
- Figure 6. *Graphopsocus cruciatus* L. ♂
- Figure 7. *Polypsocus corruptus* Hagen ♂
- Figure 8. *Teliapsocus conterminus* (Walsh) ♀
- Figure 9. *Cæcilius posticus* Banks ♀
- Figure 10. *Cæcilius aurantiacus* Hagen ♀
- Figure 11. *Cæcilius posticus* Banks ♂
- Figure 12. *Polypsocus corruptus* Hagen ♀
- Figure 13. *Ectopsocus californicus* (Banks) ♀

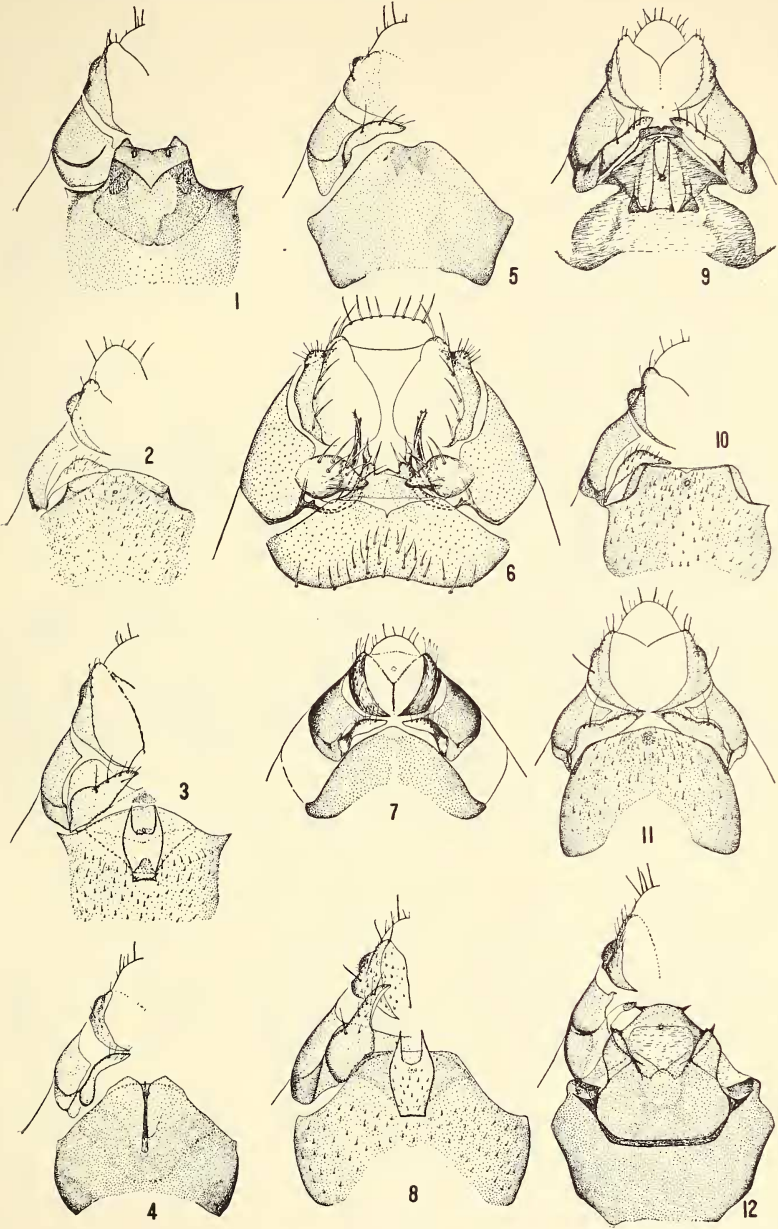




## PLATE XVII

Ventral view of genitalia and terminal abdominal segments. Structures  
*in situ*.

- Figure 1. *Lachesilla nubilis* (Aaron) ♀
- Figure 2. *Lachesilla forcepeta* n. sp. ♀
- Figure 3. *Lachesilla silvicola* n. sp. ♀
- Figure 4. *Lachesilla corona* n. sp. ♀
- Figure 5. *Lachesilla pacifica* n. sp. ♀
- Figure 6. *Pseudocacilius pretiosus* (Banks) ♀
- Figure 7. *Terracacilius pallidus* n. gen., n. sp. ♀
- Figure 8. *Lachesilla arida* n. sp. ♀
- Figure 9. *Lachesilla rufa* (Walsh) ♀
- Figure 10. *Lachesilla contraforcepeta* n. sp. ♀
- Figure 11. *Lachesilla pedicularia* L. ♀
- Figure 12. *Lachesilla punctata* (Banks) ♀

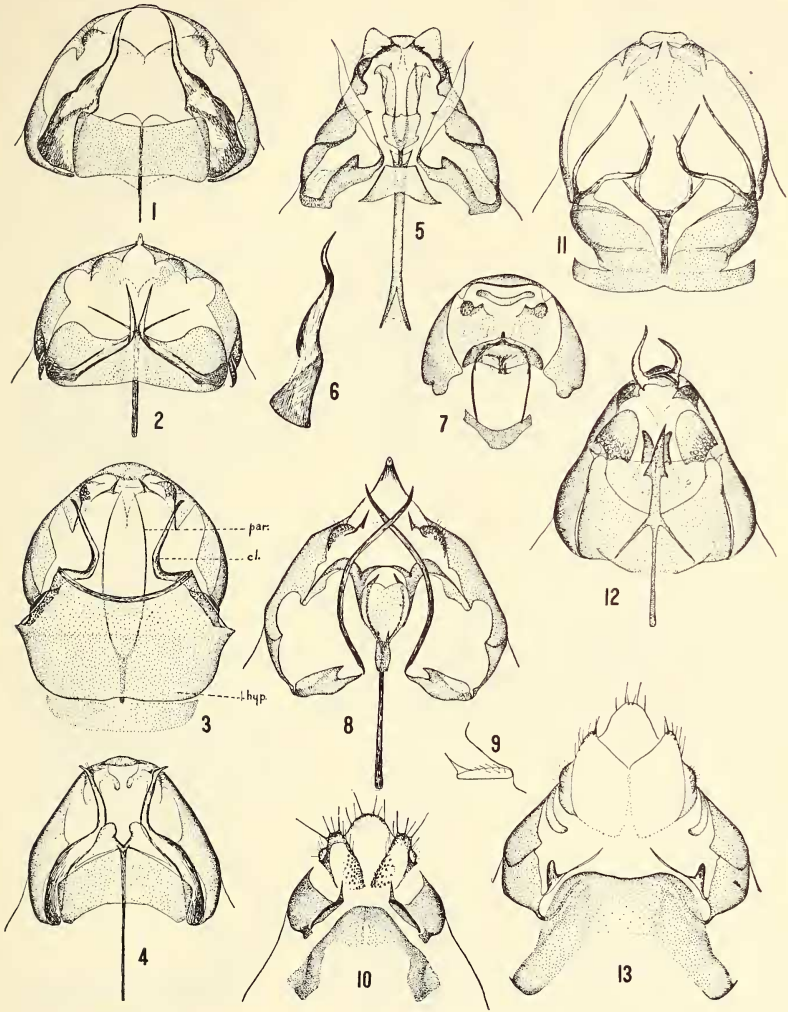


## PLATE XVIII

Ventral view of genitalia and terminal abdominal segments. Structures *in situ*.

- Figure 1. *Lachesilla forcepeta* n. sp. ♂  
Figure 2. *Lachesilla pedicularia* L. ♂  
Figure 3. *Lachesilla rufa* Walsh ♂  
Figure 4. *Lachesilla contraforcepeta* n. sp. ♂  
Figure 5. *Lachesilla nubilis* Aaron ♂  
Figure 6. *Lachesilla forcepeta* var. *major* n. sp., n. var. ♂ left clasper.  
Figure 7. *Pseudopsocus amabilis* Walsh ♂  
Figure 8. *Lachesilla punctata* Banks ♂  
Figure 9. *Pseudopsocus amabilis* Walsh ♀ right gonapophyses.  
Figure 10. *Pseudopsocus amabilis* Walsh ♀ general view of genitalia.  
Figure 11. *Lachesilla corona* n. sp. ♂  
Figure 12. *Lachesilla silvicola* n. sp. ♂  
Figure 13. *Graphopsocus cruciatus* L. ♀

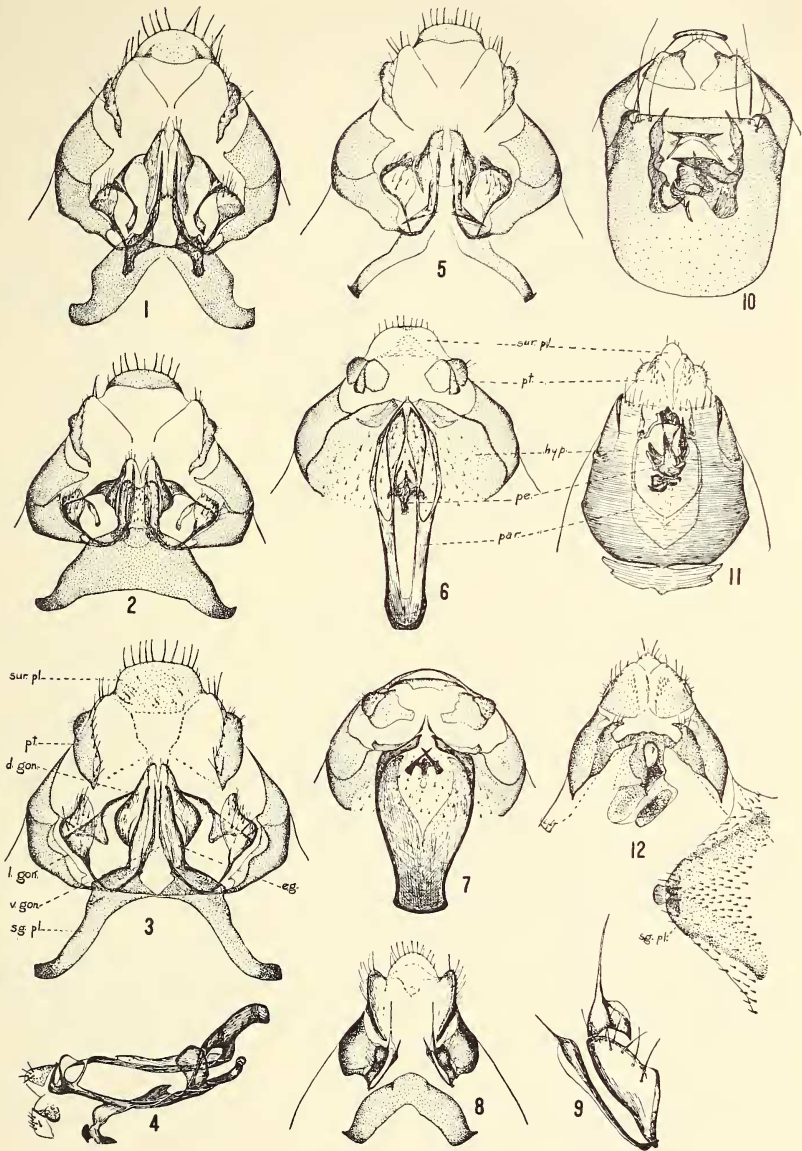




## PLATE XIX

Ventral view of genitalia and terminal abdominal segments. Structures *in situ*.

- Figure 1. *Peripsocus madescens* (Walsh) ♀  
 Figure 2. *Peripsocus quadrifasciatus* (Harris) ♀  
 Figure 3. *Peripsocus madidus* Hagen ♀ sur. pl. = suranal plate, pt. = paraprocts, d. gon. = dorsal gonapophyses, l. gon. = lateral gonapophyses, v. gon. = ventral gonapophyses, e. g. = egg-guide, sg. pl = subgenital plate.  
 Figure 4. *Ectopsocus pumilis* (Banks) ♂ (Dorsal copulatory structures).  
 Figure 5. *Peripsocus stagnivagus* n. sp. ♀  
 Figure 6. *Peripsocus madidus* Hagen ♂ sur. pl. = suranal plate, pt. = paraproct, hyp. = hypandrium, pe. = penis, par. = parameres.  
 Figure 7. *Peripsocus quadrifasciatus* ♂ (Harris).  
 Figure 8. *Bertkauia lepicidinaria* n. sp. ♀  
 Figure 9. *Bertkauia lepicidinaria* n. sp. ♀ the gonapophyses.  
 Figure 10. *Ectopsocus californicus* (Banks) ♂  
 Figure 11. *Ectopsocus pumilis* (Banks) ♂  
 Figure 12. *Ectopsocus pumilis* (Banks) ♀

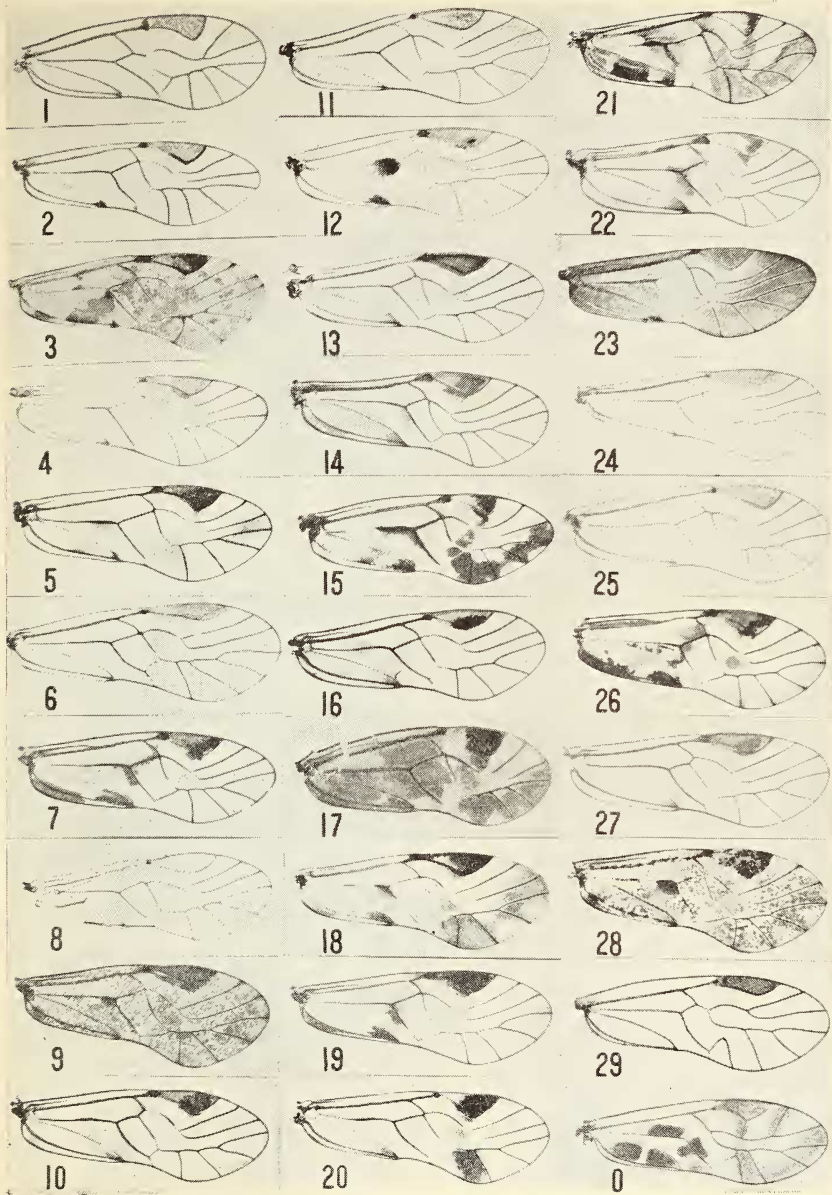


## PLATE XX

- Figure 1. *Pseudopsocus amabilis* (Walsh) ♀ (×12).  
 Figure 2. *Psocus purus* Walsh ♀ (×6).  
 Figure 3. *Psocus slossonæ* Banks ♀ (×9).  
 Figure 4. *Psocus novascotiæ* Walker ♂ (×5).  
 Figure 5. *Psocus novascotiæ* Walker ♀ (×5).  
 Figure 6. *Psocus longipennis* Banks ♂ (×5).  
 Figure 7. *Psocus striatus* Walker ♀ (×7).  
 Figure 8. *Psocus variabilis* Aaron ♀ (×9).  
 Figure 9. *Psocus moestus* Hagen ♀ (×9).  
 Figure 10. *Psocus confraternus* Banks ♀ (×7).  
 Figure 11. *Psocus lithinus* n. sp. ♀ (×7).  
 Figure 12. *Psocus leidyi* Aaron ♀ (×6).  
 Figure 13. *Psocus infumatus* Banks ♀ (×8).  
 Figure 14. *Psocus subapterous* n. sp. ♂ (×7).  
 Figure 15. *Psocus hoodi* n. sp. ♀ (×6).  
 Figure 16. *Psocus quietus* Hagen ♀ (×7).  
 Figure 17. *Psocus atratus* Aaron ♀ (×13).  
 Figure 18. *Psocus pollutus* Walsh ♀ (×8).  
 Figure 19. *Psocus crosbyi* n. sp. ♀ (×6).  
 Figure 20. *Psocus oppositus* Banks ♀ (×9).  
 Figure 21. *Psocus trifasciatus* Provancher ♀ (×7).  
 Figure 22. *Psocus texanus* Aaron ♀ (×8).  
 Figure 23. *Psocus venosus* Burmeister ♀ (×5).  
 Figure 24. *Psocus bisignatus* Banks ♀ (×9).  
 Figure 25. *Psocus inornatus* Aaron ♀ (×10).  
 Figure 26. *Psocus floridanus* Banks ♀ (×9).  
 Figure 27. *Psocus petiolatus* Banks ♀ (×8).  
 Figure 28. *Psocus maculosus* (Banks) ♀ (×9).  
 Figure 29. *Teliapsocus conterminus* (Walsh) ♀ (×8).  
 Figure 30. *Graphopsocus cruciatus* L. ♀ (×11). (3 missing from Fig. 30 on plate.)

The photomicrographs of the fore wings in Plates XX and XXI were made with apparatus described by Dr. F. P. McWhorter. "A simple and inexpensive method of making photomicrographs" in *Camera*, Dec., 1927.





## PLATE XXI

- Figure 1. *Pseudocæcilius pretiosus* (Banks) ♀ (×12).  
 Figure 2. *Peripsocus madescens* (Walsh) ♀ (×13).  
 Figure 3. *Peripsocus quadrifasciatus* (Harris) ♀ (×13).  
 Figure 4. *Peripsocus madidus* Hagen ♀ (×13).  
 Figure 11. *Peripsocus madidus* Hagen ♀ (*brachypterous*) (×13).  
 Figure 5. *Peripsocus stagnivagus* n. sp. ♀ (×22).  
 Figure 6. *Cæcilius perplexus* n. sp. ♀ (×10).  
 Figure 7. *Cæcilius cræsus* n. sp. ♀ (×14).  
 Figure 8. *Ectopsocus californicus* (Banks) ♀ (×17).  
 Figure 15. *Ectopsocus pumilis* (Banks) ♀ (×19). (5 missing from Fig. 15 on plate.)  
 Figure 9. *Lachesilla silvicola* n. sp. ♀ (×15).  
 Figure 10. *Lachesilla pedicularia* L. ♀ (dwarf) (×19).  
 Figure 17. *Lachesilla pedicularia* L. ♀ (×19). (7 missing from Fig. 17 on plate.)  
 Figure 12. *Polypsocus corruptus* Hagen ♀ (×9).  
 Figure 13. *Polypsocus corruptus* Hagen ♂ (×9).  
 Figure 14. *Cæcilius aurantiacus* Hagen ♀ (×11).  
 Figure 16. *Lachesilla rufa* (Walsh) ♀ (×12).  
 Figure 18. *Lachesilla nubilis* (Aaron) ♀ (×15).  
 Figure 19. *Lachesilla contraforcepeta* n. sp. ♀ (×20).  
 Figure 20. *Cæcilius posticus* Banks ♂ (×14).  
 Figure 21. *Cæcilius quillayute* n. sp. ♀ (×10).  
 Figure 22. Fore wing of *Psocus* with the principal veins and cells lettered.

